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EOSDIS Core System Project

ECS Project Training Material Volume 7: Resource Planning

July 1999

Raytheon Systems Company
Upper Marlboro, Maryland

ECS Project Training Material Volume 7: Resource Planning

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Preface

This document is a contract deliverable with an approval code of 3. As such, it does not require formal Government approval. This document is delivered for information only, but is subject to approval as meeting contractual requirements.

Any questions should be addressed to:

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Abstract

This is Volume 7 of a series of lessons containing the training material for Release 5A of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS). This lesson provides a detailed description of the process required for integrating resource requests into a resource plan for a site, scheduling resources on a daily, weekly and monthly basis and reviewing the process for implementing plans.

Keywords: training, instructional design, course objective, planning, resource planning.

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Introduction

Identification

Training Material Volume 7 is part of Contract Data Requirements List (CDRL) Item 129, whose requirements are specified in Data Item Description (DID) 625/OP3 and is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Core System (ECS), Contract (NAS5-60000).

Scope

Training Material Volume 7 describes the procedures by which ECS personnel prepare resource reservation requests and resource planners prepare resource plans. This lesson is designed to provide the operations staff with sufficient knowledge and information to satisfy all lesson objectives.

Purpose

The purpose of this Student Guide is to provide a detailed course of instruction that forms the basis for understanding resource planning. Lesson objectives are developed and will be used to guide the flow of instruction for this lesson. The lesson objectives will serve as the basis for verifying that all lesson topics are contained within this Student Guide and slide presentation material.

Status and Schedule

This lesson module provides detailed information about training for Release 5A. Subsequent revisions will be submitted as needed.

Organization

This document is organized as follows:

Introduction:	The Introduction presents the document identification, scope, purpose, and organization.
Related Documentation:	Related Documentation identifies parent, applicable and information documents associated with this document.
Student Guide:	The Student Guide identifies the core elements of this lesson. All Lesson Objectives and associated topics are included.
Slide Presentation:	Slide Presentation is reserved for all slides used by the instructor during the presentation of this lesson.

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Related Documentation

Parent Document

The parent document is the document from which this ECS Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
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Applicable Documents

The following documents are referenced within this ECS Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

535-TIP-CPT-001	Goddard Space Flight Center, Mission Operations and Data Systems Directorate (MO&DSD) Technical Information Program Networks Technical Training Facility, Contractor-Provided Training Specification
609-CD-500	Release 5A Operations Tools Manual for the ECS Project
611-CD-500	Mission Operation Procedures for the ECS Project

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the ECS Training Material.

220-TP-001	Operations Scenarios - ECS Release B.0 Impacts
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305-CD-020	Release B SDPS/CSMS System Design Specification Overview for the ECS Project
305-CD-021	Release B SDPS Client Subsystem Design Specification for the ECS Project
305-CD-022	Release B SDPS Interoperability Subsystem Design Specification for the ECS Project
305-CD-023	Release B SDPS Data Management Subsystem Design Specification for the ECS Project
305-CD-024-	Release B SDPS Data Server Subsystem Design Specification for the ECS Project
305-CD-025	Release B SDPS Ingest Subsystem Design Specification [for the ECS Project]
305-CD-026	Release B SDPS Planning Subsystem Design Specification for the ECS Project
305-CD-027	Release B SDPS Data Processing Subsystem Design Specification for the ECS Project
305-CD-028	Release B CSMS Communications Subsystem Design Specification for the ECS Project
305-CD-029	Release B CSMS System Management Subsystem Design Specification for the ECS Project
305-CD-030	Release B GSFC DAAC Design Specification for the ECS Project
305-CD-031	Release B Langley DAAC Design Specification for the ECS Project
305-CD-033	Release B EDC DAAC Design Specification for the ECS Project
305-CD-034	Release B ASF DAAC Design Specification for the ECS Project
305-CD-035	Release B NSIDC DAAC Design Specification for the ECS Project
305-CD-036	Release B JPL PO.DAAC Design Specification for the ECS Project
305-CD-037	Release B ORNL DAAC Design Specification for the ECS Project
305-CD-038	Release B System Monitoring and Coordination Center Design Specification for the ECS Project
305-CD-039	Release B Data Dictionary Subsystem Design Specification for the ECS Project
601-CD-001	Maintenance and Operations Management Plan for the ECS Project
604-CD-001	Operations Concept for the ECS Project: Part 1-- ECS Overview
604-CD-002	Operations Concept for the ECS Project: Part 2B -- ECS Release B

605-CD-002	Release B SDPS/CSMS Operations Scenarios for the ECS Project
607-CD-001	ECS Maintenance and Operations Position Descriptions
500-1002	Goddard Space Flight Center, Network and Mission Operations Support (NMOS) Certification Program, 1/90

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Resource Planning Overview

Lesson Overview

This lesson will provide you with the complete process by which ECS personnel prepare resource reservation requests and resource planners prepare resource plans. The processes described in the lesson apply to resource planners and other maintenance and operations personnel who manage system hardware resources. The procedures involved in resource planning include such tasks as preparing, validating, approving, and committing resource reservation requests, reviewing resource timelines, and defining resources.

Lesson Objectives

Overall Objective - The overall objective of the Resource Planning lesson is for Maintenance and Operations (M&O) personnel to develop proficiency in the procedures that apply to resource planning operations for the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS).

Condition - The student will be given oral or written information and requirements for performing resource planning activities, access to the Planning Subsystem, a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform resource planning activities in accordance with the prescribed procedures without error.

Specific Objective 1 - The student will describe the general steps in the resource planning process from the preparation of a resource reservation request to the publication of a resource plan.

Condition - The student will be given written or oral questions concerning the general steps in the resource planning process.

Standard - The student will state without error the general steps involved in the resource planning process in accordance with the applicable procedure.

Specific Objective 2 - The student will perform the steps involved in launching resource planning applications.

Condition - The student will be given a statement of the requirements for launching resource planning applications, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in launching resource planning applications in accordance with the applicable procedure.

Specific Objective 3 - The student will perform the steps involved in shutting down resource planning applications.

Condition - The student will be given a statement of the requirements for shutting down resource planning applications, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in shutting down resource planning applications in accordance with the applicable procedure.

Specific Objective 4 - The student will perform the steps involved in synchronizing resource listings.

Condition - The student will be given a statement of the requirements for synchronizing resource listings, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in synchronizing resource listings in accordance with the applicable procedure.

Specific Objective 5 - The student will perform the steps involved in determining the actual processing resources to be added to the resource planning list.

Condition - The student will be given a statement of the requirements for determining the actual processing resources to be added to the resource planning list, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in determining the actual processing resources to be added to the resource planning list in accordance with the applicable procedure.

Specific Objective 6 - The student will perform the steps involved in adding resources to the resource planning list.

Condition - The student will be given a statement of the requirements for adding resources to the resource planning list, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in adding resources to the resource planning list in accordance with the applicable procedure.

Specific Objective 7 - The student will perform the steps involved in modifying resources on the resource planning list.

Condition - The student will be given a statement of the requirements for modifying resources on the resource planning list, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in modifying resources on the resource planning list in accordance with the applicable procedure.

Specific Objective 8 - The student will perform the steps involved in deleting resources from the resource planning list.

Condition - The student will be given a statement of the requirements for deleting resources from the resource planning list, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in deleting resources from the resource planning list in accordance with the applicable procedure.

Specific Objective 9 - The student will perform the steps involved in preparing a resource reservation request.

Condition - The student will be given a statement of the requirements for preparing a resource reservation request, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in preparing a resource reservation request in accordance with the applicable procedure.

Specific Objective 10 - The student will perform the steps involved in editing/modifying a resource reservation request.

Condition - The student will be given a statement of the requirements for editing/modifying a resource reservation request, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in editing/modifying a resource reservation request in accordance with the applicable procedure.

Specific Objective 11 - The student will perform the steps involved in validating or rejecting a resource reservation request.

Condition - The student will be given a statement of the requirements for validating or rejecting a resource reservation request, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in validating or rejecting a resource reservation request in accordance with the applicable procedure.

Specific Objective 12 - The student will perform the steps involved in approving resource reservation requests.

Condition - The student will be given a statement of the requirements for approving resource reservation requests, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in approving resource reservation requests in accordance with the applicable procedure.

Specific Objective 13 - The student will perform the steps involved in committing resource reservation requests.

Condition - The student will be given a statement of the requirements for committing resource reservation requests, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in committing resource reservation requests in accordance with the applicable procedure.

Specific Objective 14 - The student will perform the steps involved in deleting resource reservation requests.

Condition - The student will be given a statement of the requirements for deleting resource reservation requests, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in deleting resource reservation requests in accordance with the applicable procedure.

Specific Objective 15 - The student will perform the steps involved in reviewing a resource timeline.

Condition - The student will be given a statement of the requirements for reviewing a resource timeline, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in reviewing a resource timeline in accordance with the applicable procedure.

Specific Objective 16 - The student will perform the steps involved in troubleshooting resource-planning problems.

Condition - The student will be given a statement of resource planning trouble symptoms, access to the Planning Subsystem (through a workstation or X terminal), a copy of 609-CD-500-001, *Release 5A Operations Tools Manual for the ECS Project*, and a copy of 611-CD-500-001, *Mission Operation Procedures for the ECS Project*.

Standard - The student will perform without error the steps involved in troubleshooting resource planning problems in accordance with the applicable procedure.

Importance

This lesson applies to students who will be resource planners or who will manage system hardware resources. The lesson will provide them with the knowledge and skills needed when performing their assigned tasks. Those tasks include (among other things) defining resources, preparing, validating, approving, and committing resource reservation requests, reviewing resource timelines, and troubleshooting resource planning problems. The lesson describes why and how the activities are performed. Consequently, the students will become aware of what tasks they will be performing on the job and how to accomplish those tasks.

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Resource Planning Concepts

ECS Context

The ECS resource planning process is accomplished at the Distributed Active Archive Centers (DAACs). The people involved in resource planning activities are the Resource Planner, Resource Manager, and personnel requesting the use of DAAC production resources for non-production-related purposes.

- The Resource Planner defines resources in the Planning and Data Processing Subsystems' (PDPS) database and develops proposed resource plans based on resource reservation requests for non-production-related activities.
- The Resource Manager puts a resource plan into effect.
- Personnel who have a need for Planning Subsystem or Data Processing Subsystem resources submit requests for time on specified resources to accomplish the non-routine activities that they plan to undertake.

The ECS Context Diagram (Figure 1) shows the relationships among the Planning Subsystem, Data Processing Subsystem, Data Server Subsystem, and the other subsystems within the Science Data Processing component of ECS. Of course, the context diagram shows a generalized (high-level) view of ECS. The Planning Subsystem Architecture diagram (Figure 2) focuses on the resource and production planning processes and their relationships with each other and with other subsystems.

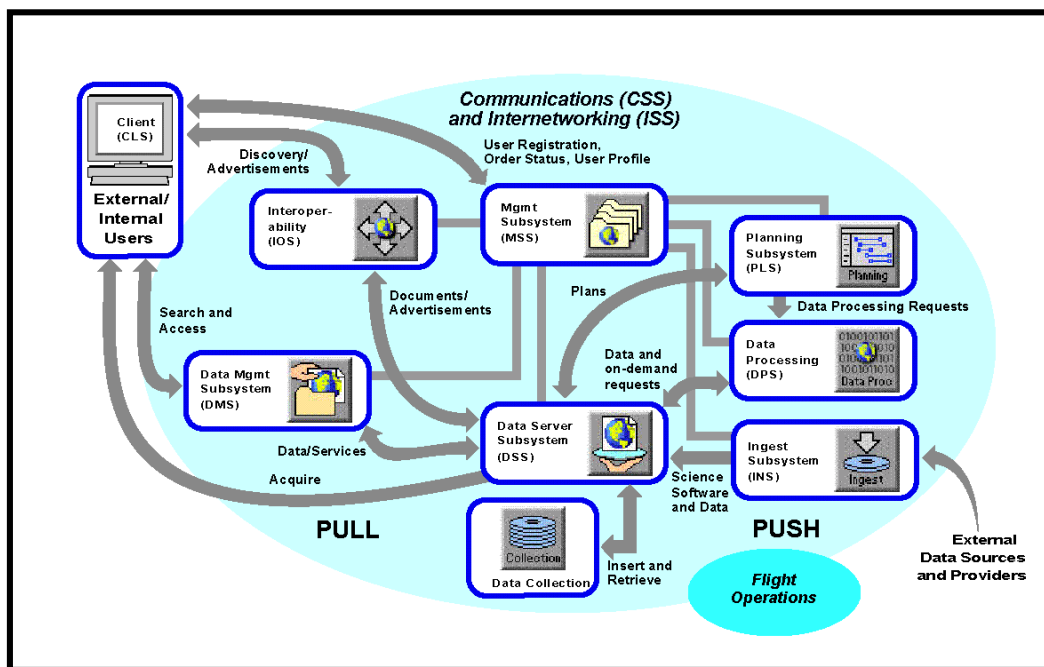


Figure 1. ECS Context Diagram

The Planning Subsystem (Figure 2) provides a mechanism for accomplishing the following general functions:

- Defining DAAC production resources.
- Scheduling production resources for non-production-related activities.
- Defining data processing jobs to be performed at the DAAC.
- Generating efficient plans for scheduling defined data processing jobs.
- Coordinating production with the Data Server Subsystem and Data Processing Subsystem to achieve a highly automated production system.

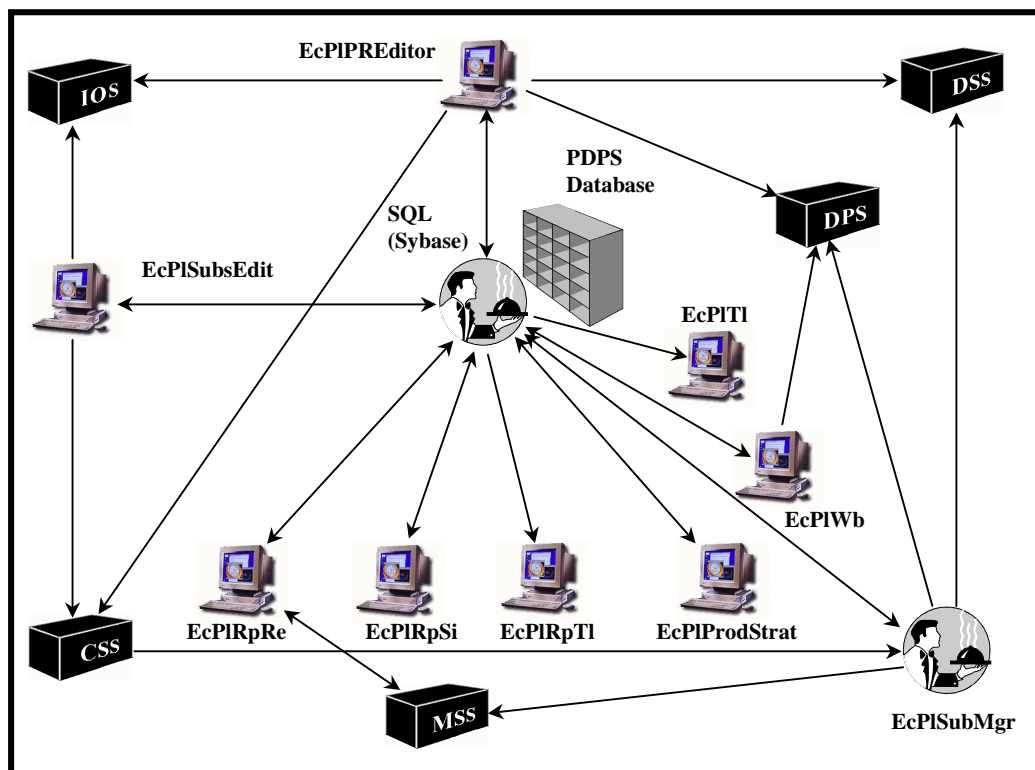


Figure 2. Planning Subsystem Architecture

Planning Subsystem

The Planning Subsystem (Figure 2) is the ECS Science Data Processing subsystem that is used when defining resources and developing resource plans. DAAC personnel have access to the resource planning functions of the Planning Subsystem primarily through the Resource Scheduler and the Resource Editor GUIs, which are components of the Resource Planning Workbench in the Planning Subsystem.

The Planning Subsystem is composed of just one computer software configuration item (CSCI); i.e., PLANG. The subsystem has the following major components as shown in Figure 2:

- Resource Planning Workbench.
 - Resource Editor (EcPIRpRe) - Graphical user interface (GUI) for defining/editing the resources at the site.
 - Resource Scheduler (EcPIRpSi) - GUI for creating/approving/committing resource reservations for non-production-related events and preparing a site resource schedule.
 - Resource Reservation Planning Master Timeline GUI (EcPIRpTl) - Graphical interface for displaying the resource schedule.
- Production Request Editor (EcPIPREditor).
 - GUI for submitting production requests that describe the data products to be produced; uses product generation executive (PGE) descriptions to generate the data processing requests (DPRs) necessary to fulfill the production requests.
- Production Planning Workbench.
 - Planning Workbench GUI (EcPIWb) - GUI for preparing and activating a site production schedule.
 - Production Strategies GUI (EcPIProdStrat) - GUI for defining production strategies (assign priorities for DPRs based on such characteristics as the type of production request, who is requesting processing, and the type of PGE to be run).
 - Planning Master Timeline GUI (EcPITl) - Graphical interface for displaying production schedules, including resource reservations.
- Subscription Manager (EcPISubMgr).
 - Server that manages receipt of subscription notifications (e.g., availability of input data needed for DPRs).
- Subscription Editor (EcPISubsEdit).
 - Character-based user interface that may be used to either submit or withdraw subscriptions for notification of system events (e.g., insertion of data into the archive).
 - Subscriptions may be submitted on behalf of a general user or on behalf of the Planning Subsystem.

- Sybase Structured Query Language (SQL) Server.
 - Commercial off-the-shelf (COTS) software application that handles insertion of data for planning and processing activities into the Planning and Data Processing Subsystems' (PDPS) shared database.

In addition to the preceding major components the Planning Subsystem includes the following components associated with both the resource planning applications and the production planning workbench:

- Message Handler (EcPlMsh).
 - GUI that displays various types of messages including warning messages and information messages.
- System Name Server (EcPlSns).
 - Handles interprocess communication.
- Resource Model (EcPlRpRm, EcPlRm).
 - Underlying resource data coordinators for the planning software.

The Message Handler, System Name Server, and Resource Model are associated with both the resource planning workbench and the production planning workbench applications:

The Resource Planning Process

One of the principles of operation underlying resource planning is that resources are routinely allocated to specific system services. For example, the processors that are used for production processing are normally dedicated to that purpose on a long-term basis. Likewise, the processors that are used for Science Software Integration and Test (SSI&T) are normally dedicated to SSI&T on a long-term basis. It is on an exception basis that they are allocated to other activities.

Any activity that requires the use of production resources for non-production-related purposes is considered a “ground event.” Ground events include the following types of activities (among others):

- testing.
- preventive maintenance.
- system upgrades.

The resource planning process is the mechanism by which reservations for ground events are defined and controlled. Resource planning affects the resources that are scheduled during the production planning process; consequently, resource planning and production planning are interdependent.

- In general, both resource planning and production planning involve planning for the next day, week and month.

- Resource Planning activities occur on a biweekly basis for 30-day plans, on a weekly basis for 10-day plans, and on a daily basis.
- However, requests to support ground events may be entered at any time.

Personnel who have a need for Planning Subsystem or Data Processing Subsystem resources submit requests for time on specified resources to accomplish the non-routine activities that they plan to undertake.

- Depending on DAAC policy, many personnel may have access to the resource planning applications for creating resource reservation requests.
- Alternatively, personnel may have to contact the Resource Planner to have resource reservation requests entered for them.
- The site Resource Planner uses the Resource Planning applications when processing resource reservation requests for ground events.
- The Resource Planner uses the Resource Editor for adding resources to or modifying the characteristics of resources on the list of resources in the PDPS database.
- The Resource Manager uses the Resource Planning applications when preparing resource plans/schedules.

The Resource Planner defines ECS resources used in production planning and processing in the following terms:

- “AutoSys” (production processing software).
- “computers” (virtual computers composed of central processing units (CPUs) and associated disks).
- “real computers” (composed of virtual computers).
- “disks.”
- generic “hardware.”
- “strings” (sets of virtual computers).

The resource planning list in the PDPS database is initialized with the resource data from the Baseline Manager database. Resources may be added to or deleted from the resource planning list in the PDPS database without affecting the Baseline Manager database. Consequently, the Resource Planner is able to specify resources that are not currently usable but will become available in the future. Furthermore, the Resource Planner can reset resource planning to the baseline at any time. (This is an important feature because the baseline actually changes over time.)

The Resource Planner reviews requests for resource reservations to determine if the requests are valid. Requests include the following types of information:

- activity description.

- resource(s) required.
- time period(s) for using the requested resource(s).
- comments (e.g., explanation of variance from normal use).

The Resource Planner may decide to forward the request to someone whose expertise is particularly relevant to the request in order to validate the request. The experts who evaluate resource reservation requests for validation purposes are called "sponsors."

Should the sponsor agree that the request to reserve the resource is valid, the Resource Planner "approves" it along with all other requests that have been validated. The set of all validated resource reservation requests is considered a draft Resource Plan. The scheduling software identifies conflicts (if any) in the draft Resource Plan and alerts the Resource Planner to the problem(s). If possible, the Resource Planner resolves all conflicts before presenting the proposed plan to the Resource Manager to have the resources committed. However, during the conflict-resolution process the Resource Planner may have to consult with resource requesters and the Resource Manager to ensure that the reserved resources will not have adverse effects on the DAAC's high-priority events. When the Resource Planner has achieved a conflict-free plan, it is presented to the Resource Manager to be implemented. The Resource Manager "commits" the plan, which signals the Planning Subsystem to put the plan into effect. Committing a plan actually involves committing all of the individual approved resource reservation requests included in the plan.

Launching and Shutting Down Resource Planning Applications

Launching Resource Planning Applications

As previously mentioned the following two (2) software applications are the principal operator tools associated with Resource Planning:

- Resource Scheduler GUI (Scheduling Interface).
- Resource Editor GUI.

Other applications associated with resource planning include the following items:

- Message Handler (which displays various types of messages).
- System Name Server (which handles interprocess communication).
- Resource Planning System Resource Model (which is an underlying resource data coordinator for the resource planning software).
- Resource Reservation Planning Master Timeline GUI (which provides a graphic display of resource allocations).

Depending on DAAC policy, all ECS personnel who may need to use system resources could be granted access to the Resource Planning tool for the purpose of submitting resource reservation requests. Personnel who may be appointed “sponsors” for the purpose of validating resource reservation requests should have authorization to validate those requests. Other functions of Resource Planning and the Resource Definition features should be reserved for the Resource Planner and Resource Manager.

Access to the resource planning applications is gained through the use of UNIX commands. Launching resource planning applications starts with the assumption that the applicable host is active and the operator (resource requester, Resource Planner, sponsor, or Resource Manager) has logged in to the ECS system.

Launching Resource Planning Applications

NOTE: Commands in Steps 1 through 11 are typed at a UNIX system prompt.

1 At the UNIX command line prompt type **xhost *hostname*** then press the **Return/Enter** key on the keyboard.

- ***hostname*** refers to the host on which GUIs are to be launched during the current operating session. Multiple hostnames can be specified on the same line.

- The use of **xhost +** is discouraged because of a potential security problem.
- 2 Type **setenv DISPLAY *clientname*:0.0** then press the **Return/Enter** key.
 - Use either the X terminal/workstation IP address or the machine-name for the *clientname*.
 - When using secure shell, the DISPLAY variable is set just once, before logging in to remote hosts. If it were to be reset after logging in to a remote host, the security features would be compromised.
 - 3 Open another UNIX (terminal) window.
 - 4 Start the log-in to the Planning/Management Workstation by typing **/tools/bin/ssh *hostname*** (e.g., **e0pls03**, **g0pls01**, **l0pls02**, or **n0pls02**) in the new window then press the **Return/Enter** key.
 - If you receive the message, **Host key not found from the list of known hosts. Are you sure you want to continue connecting (yes/no)?** type **yes** (“y” alone will not work).
 - If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears; continue with Step 5.
 - If you have not previously set up a secure shell passphrase; go to Step 6.
 - 5 If a prompt to **Enter passphrase for RSA key '<user@localhost>'** appears, type your *Passphrase* then press the **Return/Enter** key.
 - Go to Step 7.
 - 6 At the **<user@remotehost>'s password:** prompt type your *Password* then press the **Return/Enter** key.
 - 7 Type **setenv ECS_HOME /usr/ecs/** then press the **Return/Enter** key.
 - When logging in as a system user (e.g., **cmshared**), the ECS_HOME variable may be set automatically so it may not be necessary to perform this step.
 - 8 Type **cd /usr/ecs/MODE/CUSTOM/utilities** then press **Return/Enter**.
 - Change directory to the directory containing the resource planning start-up scripts (e.g., **EcPIRpAllStart**).
 - The *MODE* will most likely be one of the following operating modes:
 - OPS (for normal operation).
 - TS1 (for SSI&T).
 - TS2 (new version checkout).

- Note that the separate subdirectories under /usr/ecs apply to (describe) different operating modes.
- 9 Type **EcPIRpAllStart** *MODE ApplicationID* then press **Return/Enter** to launch the Message Handler, System Name Server, and the Resource Model.
- The **Message Handler** graphical user interface (GUI) (Figure 3) is displayed.

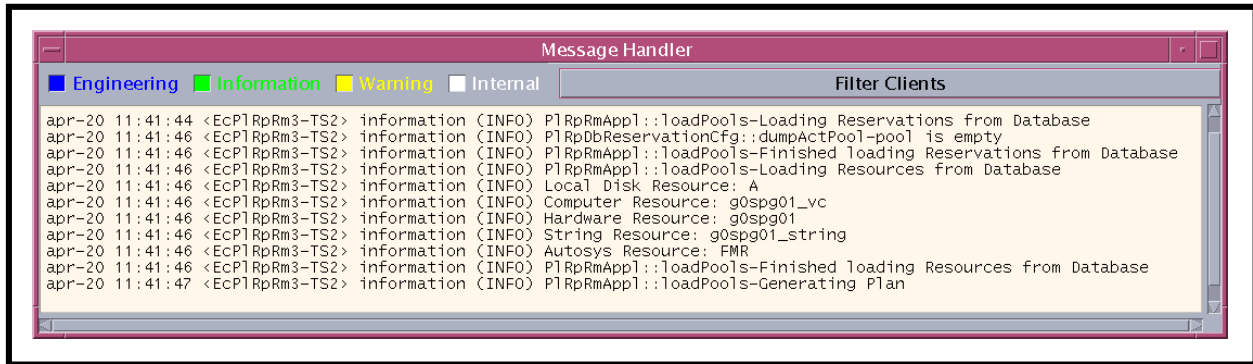


Figure 3. Message Handler GUI

- When the **Message Handler** GUI displays a message that concludes with “...Finished loading all records from the database”, it is time to get a UNIX prompt and continue with the next step.
- The **Message Handler** GUI displays messages of the following types:
 - Engineering.
 - Information.
 - Warning.
 - Internal.
- The **System Name Server** (SNS) handles interprocess communication.
- The **Resource Model** is an underlying resource data coordinator for the resource planning software.
- The **ApplicationID** (also called MSGSRV_ID) is any number from 1 to 5. It identifies the message service in use so messages can be directed to the proper message handler GUI. Consequently, it is a good idea to use the same ApplicationID consistently during a resource planning session.

10 If the Resource Editor is to be launched, type **EcPIRpReStart *MODE ApplicationID*** then press **Return/Enter**.

- The **Resource Editor** (Figure 4) is displayed.
- The **Resource Editor** provides the following data on each resource (as indicated by the column headers for the resource list):
 - **Resource Name**.
 - **Type [of resource]**.
 - **Activity**.

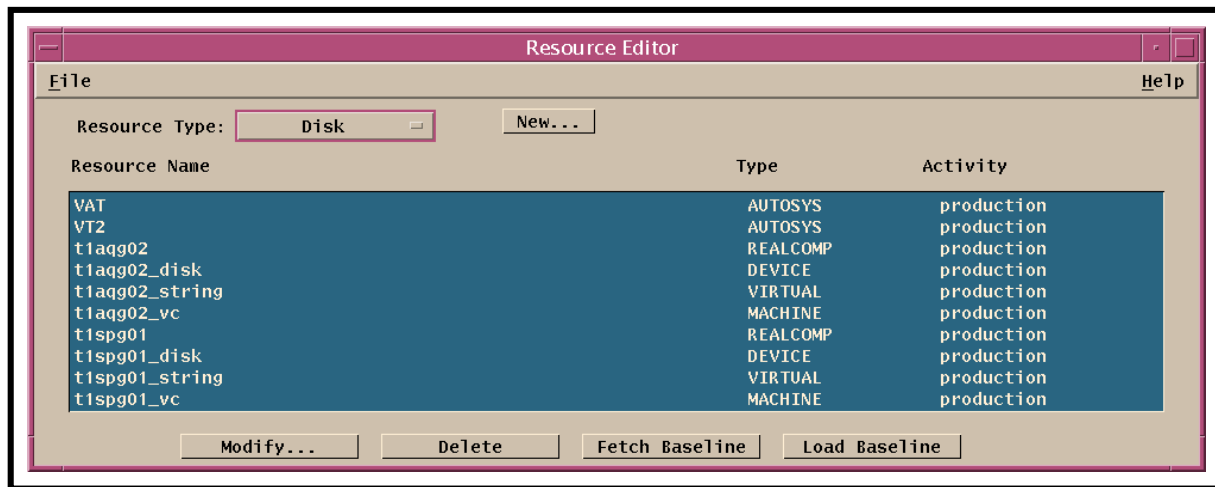


Figure 4. Resource Editor

- A set of buttons enables the following operations:
 - **New...** - Define a new resource in the resource list in the PDPS database.
 - **Modify...** - Edit or review the details of an existing resource.
 - **Delete** - Delete an existing resource from the resource list in the PDPS database.
 - **Fetch Baseline** - Retrieve resource information from the System Management Subsystem (MSS)-managed list of configured system resources.
 - **Load Baseline** - Load the resource information from the MSS-managed list of configured system resources into the resource list in the PDPS database.
- 11 If the Resource Planning tool (Scheduling Interface) is to be launched, type **EcPIRpSiStart *MODE ApplicationID*** then press **Return/Enter**.
- The **Resource Scheduler** (Figure 5) is displayed.

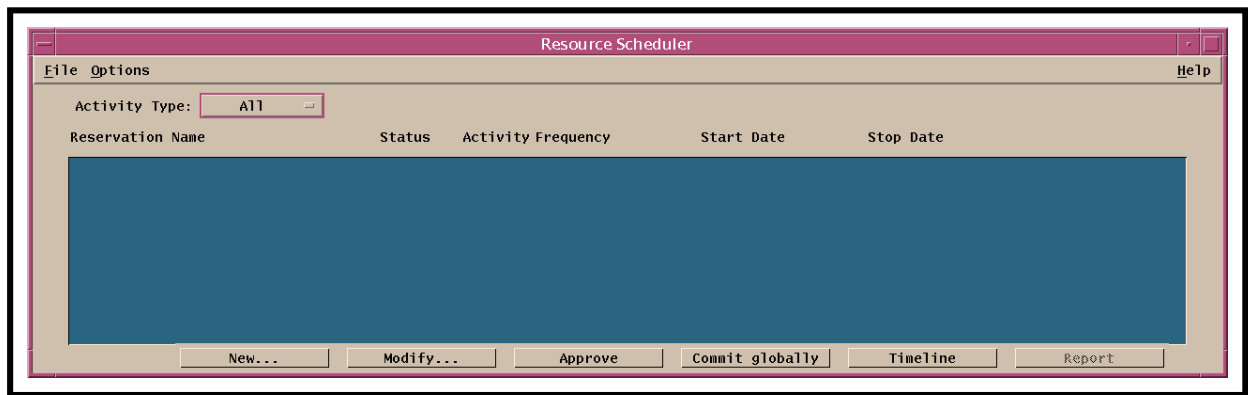


Figure 5. Resource Scheduler

- It may be worthwhile to launch the **Resource Scheduler** from a separate terminal/X-term window because the window from which it is launched is continuously refreshed and is unavailable for entering any additional commands.
- The **Resource Scheduler** shows the **Resource Reservation List**, which provides the following data on each resource reservation request (as indicated by the column headers for the list):
 - **Reservation Name.**
 - **Status** [of each reservation].
 - **Activity** [type of activity].
 - **Frequency.**
 - **Start Date** [and time].
 - **Stop Date** [and time].
- In addition, a set of buttons enables the following operations:
 - **New...** - Create a resource reservation request (brings up the **Resource Reservation Request Edit/Definition** GUI described in a subsequent section of the lesson).
 - **Modify...** - Edit or review the details of an existing resource reservation request (brings up the **Resource Reservation Request Edit/Definition** GUI).
 - **Approve** - Used to indicate that the selected resource reservation request(s) has (have) been validated and a draft resource plan can be created. Clicking on this button causes the Planning Subsystem to determine whether there are conflicts among resource reservations. The Planning Subsystem detects conflicts and reports them to the operator.
 - **Commit globally** - Commit all “approved” resource reservations. (Commit to a plan.)

- **Time Line** - Display a timeline-oriented view of the resource plan in the **Resource Reservation Planning Master Timeline** GUI.
 - **Report** - The **Report** option is disabled. The reports have been deleted from the system requirements.
-

Shutting Down Resource Planning Applications

When resource planning activities have been completed, the Message Handler, System Name Server, and Resource Model should be shut down to eliminate unneeded processes and allow other operators to gain access to the resource planning applications. If any of the three processes remains active, it is likely to interfere with subsequent attempts to launch resource planning applications.

Shutting down resource planning applications starts with the assumption that the **Resource Editor** (Figure 4) and the **Resource Scheduler** (Figure 5) have been launched and the GUIs are currently being displayed.

Shutting Down Resource Planning Applications

- 1 To quit the **Resource Editor** when resource planning activities have been completed select **File → Exit** from the GUI's pull-down menu.
 - The **Resource Editor** (Figure 4) disappears.
- 2 To quit the **Resource Scheduler** when resource planning activities have been completed select **File → Exit** from the GUI's pull-down menu.
 - The **Resource Scheduler** (Figure 5) disappears unless there are resource reservation requests with a status of "approved".
 - If there are any resource reservation requests with a status of "approved" listed on the **Resource Scheduler**, a **Close Application** pop-up dialogue box is displayed with a message "Status of the listed reservations" and a list of the resource reservation requests with "approved" status.
- 3 If the **Close Application** pop-up dialogue box is displayed, click on the appropriate button from the following selections:
 - **Ok** - to quit the **Resource Scheduler** and dismiss the dialogue box.
 - **Cancel** - to dismiss the dialogue box and return to the **Resource Scheduler**.
- 4 After quitting the **Resource Editor/Resource Scheduler** GUI(s) click in the UNIX window used to start the resource planning applications.

- 5 Type **EcPIRpSlayAll** *MODE ApplicationID* then press **Return/Enter** to shut down the Message Handler, System Name Server, and Resource Model.
 - The **Message Handler** GUI (Figure 3) disappears.
 - 6 Type **ps -ef | grep** *MODE* then press **Return/Enter** to obtain a list of active processes in the specified mode.
 - A list of active processes in the specified mode is displayed.
 - If an error message is received when **ps -ef | grep** *MODE* is entered, type **ps -auxwww | grep** *MODE* then press **Return/Enter**.
 - 7 Examine the list of processes running in the specified mode to determine whether the Message Handler, System Name Server, and Resource Model processes have actually been shut down.
 - None of the following processes should be active:
 - EcPIRpRe
 - EcPIRpSi
 - EcPIRpTl
 - EcPIMsh
 - EcPISns
 - EcPIRpRm
 - 8 If any of the specified processes [especially the Message Handler, System Name Server, and/or Resource Model process(es)] is/are still active, type **kill -15** *process_id1 [process_id2] [process_id3] [...]* to terminate the active process(es).
 - 9 Repeat Steps 6 through 8 as necessary.
-

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Defining Resources

The resource planning list is initialized with a set of resources from the MSS-managed list of configured system resources [i.e., the Baseline Manager (XRP II) database]. Resources may be added to or deleted from the resource planning list without affecting the MSS-managed configuration list. One benefit of using a separate resource planning list is to facilitate planning future activities that require resources which are not currently available but are expected to become available before the start of the activity requiring their use.

The Resource Editor allows the authorized operator to perform the following functions:

- synchronize the resource planning list with the baseline set of system resources.
- add or delete future resources not contained in the baseline resource list.
- modify the characteristics of resources.

Modifications to the resource planning list are recorded in the PDPS database. The modifications are **not** recorded in the Baseline Manager database.

The hardware resources for which resource planning can be supported include host computers and storage devices, as well as “strings” that are sets of “real” computers.

Synchronizing Resource Listings

The procedure for synchronizing resource listings reloads the **Resource Definition** list from the Baseline Manager database, making the information in the two databases consistent. The retrieval of configuration information is a two-step process. First a Tivoli job is run that generates a file of configuration information used by Resource Planning. This job is run by clicking on the **Fetch Baseline** button. When the Tivoli job has completed, the operator clicks on the **Load Baseline** button to extract the needed information from the Tivoli-generated file and load it into the PDPS database. The procedure starts with the assumption that the Resource Planner has logged in to the ECS system and the proper desktop environment is being displayed.

NOTE: Before attempting to synchronize resource listings, ask the local Configuration Management Administrator whether the resources have been defined in the Baseline Manager database at your site. If the resources have **not** been defined in the Baseline Manager, they will have to be added to the **Resource Definition** list as described in the procedure for **Adding a Resource**.

Synchronizing Resource Listings

- 1 Launch the **Resource Editor** tool (if it has not been launched already).
 - The **Resource Editor** (Figure 4) is displayed.

- 2 Click on the **Fetch Baseline** button to generate a Tivoli file with the baseline data.
 - The **Baseline Request** pop-up window (Figure 6) is displayed.
 - 3 If applicable, type the date for the desired baseline (in *DD MMM YYYY* format) in the **Enter Baseline Date** field.
 - For example: 01 JAN 1999.
 - 4 Click on the **OK** button to apply the baseline date and dismiss the **Baseline Request** pop-up window.
 - To cancel fetching the baseline and dismiss the **Baseline Request** pop-up window click on the **Cancel** button.
 - 5 When the Tivoli job has completed, click on the **Load Baseline** button.
-

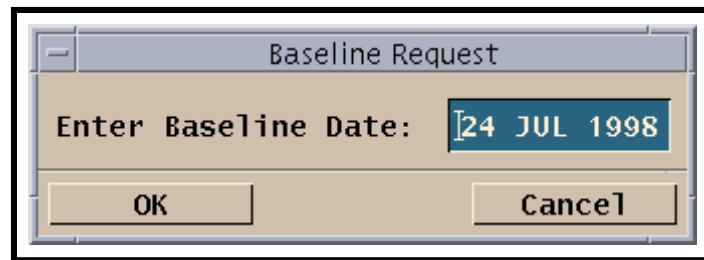


Figure 6. Baseline Request Pop-Up Window

Adding or Modifying Resources

The Resource Editor allows the authorized operator to define resources in the following categories:

- Disks.
 - Disk partitions that are associated with and provide temporary data storage for the input and output files used in processing.
- Computers.
 - Virtual computers composed of CPUs, random-access memory (RAM), and associated-disk(s).
 - The CPUs and RAM specified for a virtual computer are components of the real computer from which the virtual computer is derived.

- Real Computers.
 - Physical computing devices, each of which contains one or more CPUs.
 - Each real computer is divided into one or more virtual computers by allocating CPUs and RAM from the real computer to the virtual computer(s).
- Strings.
 - Sets of one or more virtual computers.
 - Strings are associated with the processing software (AutoSys).
 - A dual science processor configuration can be defined by specifying strings containing virtual computers derived from different real computers.
- AutoSys.
 - Identifies the string(s) of virtual computers used by the production processing software.
- Hardware.
 - Any type of equipment that is not defined as a computer or disk may be defined as “hardware.”

The ECS Operational Readiness Plan for Release 2.0 (603-CD-003-001) specifies that initially disk partitions at the DAACs are to be split among the operating modes as follows:

- OPS – 60%.
- TS1 - 20%.
- TS2 - 20%.

However, it may be advantageous to reserve some nominal percentage of the disk (e.g., two to five percent) as a safety buffer. In any case, it is critical to ensure that the sum of the disk space assigned to the various modes is no more than the total disk space available.

Although the ECS Operational Readiness Plan does not specifically mention allocating resources other than disk partitions, CPUs and RAM need to be allocated among modes in the same manner. However, it is not necessary to be exact with the CPU count or RAM amount.

- There is no one-to-one mapping of CPU allocation with actual CPUs on the science processor.
- Actual CPU usage during processing is limited by the operating system (OS).
 - If ten CPUs have been specified for a particular mode, only ten Data Processing Requests (DPRs) can be running the Execute job at a given time.
 - What is really being defined is the maximum number of DPRs that will execute at a given time.

- It is important to monitor the load on each science processor.
 - CPUs can be over-allocated or under-allocated as necessary to get the most out of the CPUs on each science processor.
 - If monitoring indicates that the processor is underused when OPS mode is at full processing capacity, the number of CPUs allocated to OPS mode could probably be increased.
 - If the science processor is at full capacity when OPS mode is at full processing capacity and it is suspected that the processor may be overworked, the number of CPUs allocated to OPS mode should be reduced.
- Random-access memory (RAM) is subject to the same considerations as CPUs.
 - RAM can be over-allocated or under-allocated as necessary to get the most out of the memory on each science processor.
- The OS takes care of true CPU and RAM allocation.

Another consideration is the throttling of the processing load through the `DpPrAutoSysMaxJobs` variable. `DpPrAutoSysMaxJobs` is defined in the `EcDpPrJobMgmt.CFG` file in the `/usr/ecs/MODE/CUSTOM/cfg` directory on the Queuing Server (e.g., `g0sps06`).

- If `DpPrAutoSysMaxJobs` in OPS mode is set at 64 [allowing AutoSys to accommodate eight DPRs (consisting of eight jobs each) simultaneously in OPS mode] and ten CPUs are defined for OPS, it would not be possible to utilize all ten CPUs.
- If the value of `DpPrAutoSysMaxJobs` were increased to 120 (15 DPRs times 8 jobs/DPR), there might be times when the processing of some DPRs was held up because only ten could be running the Execute job at a time.
 - In such a case it might be possible to increase the number of CPUs allocated to the mode so that more than ten DPRs could be running the Execute job simultaneously.

Determining Actual Processing Resources

Before data processing resources can be defined, it is necessary to know what resources are actually available at the DAAC. Some resources are defined in terms of other resources; for example, a string is defined as one or more virtual computers. However, it is generally necessary to have the following types of information available in order to define processing resources:

- Host names [“real computers”].
- Number of processors [CPUs] available on each host.
- Operating System (OS) for each host.
- Memory [RAM] on each host.

- Total disk space.
- AutoSys instance(s) at the DAAC.

The procedure for determining the actual processing resources to be defined starts with the assumption that the Resource Planner has logged in to the ECS system.

Determining Actual Processing Resources

- 1 Log in to the applicable Science Processor (e.g., e0spg01, g0spg01, l0spg01, or n0spg03) in the same manner as logging in to the Planning/Management Workstation (described in Steps 1 through 6 of the procedure for **Launching Resource Planning Applications** (previous section of this lesson).

- 2 Type **cd /usr/ecs/MODE/CUSTOM/pdps/processor/data/DpPrRm/processor_disk** then press **Return/Enter**.

- Change directory to the disk mount point (e.g.,
/usr/ecs/OPS/CUSTOM/pdps/g0spg01/data/DpPrRm/g0spg01_disk).

- 3 Type **df -k .** (being sure to include the dot) then press **Return/Enter**.

- Information concerning disk size and use is displayed; for example:

Filesystem	Type	kbytes	use	avail	%use	Mounted on
/dev/dsk/xlv/vgo1	xfs	413394688	164646048	248748640	40	/vol1

- In the preceding example the total disk space is 413,394,688 kilobytes or 413,394.69 megabytes (413 gigabytes).

- 4 Type **hinv** then press **Return/Enter**.

- Information concerning CPUs and RAM (memory) is displayed; for example (not all rows are shown):

```
Processor 0: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.6€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 1: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.6€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 2: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.6€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 3: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.6€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 4: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 5: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 6: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
```

```

FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 7: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 8: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 9: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 10: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 11: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 12: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 13: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 14: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Processor 15: 194 MHZ IP25€
CPU: MIPS R10000 Processor Chip Revision: 2.5€
FPU: MIPS R10010 Floating Point Chip Revision: 0.0€
Secondary unified instruction/data cache size: 1 Mbyte€
Data cache size: 32 Kbytes€
Instruction cache size: 32 Kbytes€
Main memory size: 2048 Mbytes, 8-way interleaved€
[...]€

```

- In the example the science processor has 16 CPUs (0-15) and 2048 megabytes of RAM.

5 Repeat Steps 1 through 4 for all other science processors (if any).

NOTE: Steps 6 through 12 describe the use of the Netscape browser to determine certain types of information concerning computer resources (including the number of CPUs and amount of RAM), which can be determined using the **hinv** command as described in Step 4. However, the “as-built” file accessed using the Netscape browser lists the necessary operating system information in addition to CPU and RAM data. The advantage of the **hinv** command is that it provides real-time data and is reliably up to date. The advantage of the “as-built” file accessed using the Netscape browser is that it provides operating system data that is not available using the **hinv** command.

6 Type **netscape** & then press **Return/Enter**.

- The Netscape web browser is displayed.

- 7 Type **http://pete.hitc.com/baseline** in the browser's **Location** field then press **Return/Enter**.
 - The **ECS Baseline Information System** page is displayed.
- 8 Select (click on) the **ECS Configuration** link.
 - A table of files is displayed.
- 9 Select (click on) the **Asbuilts** link for the relevant DAAC.
 - A list of files is displayed.
- 10 Select (click on) the file name corresponding to the desired host (e.g., x0spg01.asbuilt.html).
 - A report containing the following types of information (among other items) is displayed:
 - Host Name [“real computer”].
 - Processors [CPUs].
 - Operating System.
 - Memory [RAM].
 - Interrogation Date (useful in determining how up-to-date the information is).
- 11 Select (click on) the browser **Back** button.
 - The list of “as-built” files is displayed.
- 12 Repeat Steps 10 and 11 for all other science processors (if any).
- 13 To quit the Netscape browser when the necessary information has been acquired select **File → Exit** from the browser's pull-down menu.
 - The Netscape browser disappears.
- 14 Log in to the applicable Queuing Server host (e.g., e0sps04, g0sps06, l0sps03, or n0sps08) in the same manner as logging in to the Planning/Management Workstation (described in Steps 1 through 6 of the procedure for **Launching Resource Planning Applications Using UNIX Commands** - previous section of this lesson).
- 15 Type **cd /usr/ecs/MODE/COTS/autotree/autouser** then press **Return/Enter**.
 - Change directory to the directory (e.g., /usr/ecs/MODE/COTS/autotreeb/autouser, /usr/ecs/MODE/COTS/autotree/autouser, /data1/SHARED/COTS/autotree/autouser) containing the set-up files (e.g., FMR.autosys.csh.g0sps06) and the AutoSys configuration files (e.g., config.FMR).
 - The particular path to be typed may vary from site to site.

- The AutoSys instance at the DAAC is identified by three capital letters appended to the beginning of the set-up files and the end of the configuration file.
 - Typically, AutoSys instances at the DAACs are identified as **FMR**.
 - It is possible to have multiple AutoSys instances installed at a DAAC.
-

Example: Definition of Resources at DAAC X

At DAAC X there are two science processors; i.e., x0spg01 and x0spg02. In both cases disk space is 413,394,688 kilobytes or 413,394.688 megabytes. If it is decided to reserve 3% of each disk as a safety buffer, each disk would have a total of 400,992.847 megabytes functionally available for operational use.

In this example the resources for OPS mode are split among x0spg01 and x0spg02 but all resources for TS1 mode come from x0spg01. Likewise, all resources for TS2 mode come from x0spg02. Accordingly, the disk space is allocated among modes as follows:

- x0spg01
 - 240595.708 megabytes for OPS mode (60% of 400,992.847 megabytes rounded down).
 - 160397.138 megabytes for TS1 mode [40% of 400,992.847 megabytes (20% of 801,985.694 megabytes total for x0spg01 and x0spg02) rounded down].
- x0spg02
 - 240595.708 megabytes for OPS mode.
 - 160397.138 megabytes for TS2 mode [40% of 400,992.847 megabytes (20% of 801,985.694 megabytes total for x0spg01 and x0spg02) rounded down].

When allocating CPUs between modes, it would probably be a good idea to reserve one CPU of each science processor for use by the operating system and allocate the remainder to the various operating modes. At DAAC X the total number of CPUs in both x0spg01 and x0spg02 is 16 each. The CPUs might be allocated among modes as follows:

- x0spg01
 - 1 CPU for operating system use.
 - 9 CPUs for OPS mode.
 - 6 CPUs for TS1 mode.
- x0spg02
 - 1 CPU for operating system use.
 - 9 CPUs for OPS mode.

- 6 CPUs for TS2 mode.

Total RAM for x0spg01 is 2048 megabytes. The same is true for x0spg02. RAM might be allocated among modes as follows:

- x0spg01
 - 1228 megabytes for OPS mode.
 - 819 megabytes for TS1 mode [40% of 2048 megabytes (20% of 4096 megabytes total for x0spg01 and x0spg02) rounded down to the nearest megabyte].
- x0spg02
 - 1228 megabytes for OPS mode.
 - 819 megabytes for TS2 mode [40% of 2048 megabytes (20% of 4096 megabytes total for x0spg01 and x0spg02) rounded down to the nearest megabyte].

The resources for the OPS, TS1, and TS2 modes might be defined as shown in Table 1, Example of Resource Definitions – DAAC X.

Adding a Resource

As previously mentioned the procedures for adding a resource to the resource planning list may involve any of the following types of resources:

- “disks.”
- “computers” (virtual computers).
- “real computers”.
- “strings”.
- “AutoSys”.
- generic “hardware.”

The procedure for adding a resource starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) in the appropriate mode and the GUI is currently being displayed.

Table 1. Example of Resource Definitions – DAAC X

Resource Type	Resource Name	Activity	Partition Size [mega-bytes]	Block Size [bytes]	CPUs	RAM [mega-bytes]	Oper Sys	Associated Disks/ Computers/ Strings
OPS Mode								
Disk	x0spg01_disk_OPS	Production	240595.708	1024				
Disk	x0spg02_disk_OPS	Production	240595.708	1024				
Computer	x0spg01_vc_OPS	Production			9	1228	IRIX64.6.2	x0spg01_disk_OPS
Computer	x0spg02_vc_OPS	Production			9	1228	IRIX64.6.2	x0spg02_disk_OPS
Real Computer	x0spg01	Production						x0spg01_vc_OPS
Real Computer	x0spg02	Production						x0spg02_vc_OPS
String	string_OPS	Production						x0spg01_vc_OPS x0spg02_vc_OPS
Autosys	FMR	Production						string_OPS
TS1 Mode								
Disk	x0spg01_disk_TS1	Production	160397.138	1024				
Computer	x0spg01_vc_TS1	Production			6	819	IRIX64.6.2	x0spg01_disk_TS1
Real Computer	x0spg01	Production						x0spg01_vc_TS1
String	string_TS1	Production						x0spg01_vc_TS1
Autosys	FMR	Production						string_TS1
TS2 Mode								
Disk	x0spg02_disk_TS2	Production	160397.138	1024				
Computer	x0spg02_vc_TS2	Production			6	819	IRIX64.6.2	x0spg02_disk_TS2
Real Computer	x0spg02	Production						x0spg02_vc_TS2
String	string_TS2	Production						x0spg02_vc_TS1
Autosys	FMR	Production						string_TS2

Adding a Resource

- 1 Observe the resource type listed currently listed on the **Resource Editor** GUI **Resource Type** option button. If a different resource type is to be added, click and hold on the **Resource Type** option button and select (highlight then release the mouse button) the applicable resource type from the option menu that is displayed.
 - Resources should generally be defined in the following order due to dependencies among resource definitions (disks are essential to the definition of a virtual computer; virtual computers are essential to the definition of a real computer; etc.):
 - **Disk.**
 - **Computer** [virtual computer].
 - **Real Computer.**
 - **String.**
 - **Autosys.**
 - **Hardware.**
- 2 Click on the **New...** button.
 - The selection of the **Resource Type** determines which GUI appears when the **New...** button is activated. The following selections are available and require performance of the specified procedure to complete the addition of the resource:
 - Disk** - The **Disk Partition Details** GUI (Figure 7) is displayed. Perform the procedure for **Defining Disk Resources** (subsequent section of this lesson).
 - Computer** - The **[Virtual] Computer Details** GUI (Figure 8) is displayed. Perform the procedure for **Defining Virtual Computer Resources** (subsequent section of this lesson).
 - Real Computer** - The **Real Computer Details** GUI (Figure 9) is displayed. Perform the procedure for **Defining Real Computer Resources** (subsequent section of this lesson).
 - String** - The **String Details** GUI (Figure 10) is displayed. Perform the procedure for **Defining String Resources** (subsequent section of this lesson).
 - Autosys** - The **Autosys Details** GUI (Figure 11) is displayed. Perform the procedure for **Defining AutoSys Resources** (subsequent section of this lesson).
 - Hardware** - The **Hardware Resource Details** GUI (Figure 12) is displayed. Perform the procedure for **Defining Hardware Resources** (subsequent section of this lesson).

Defining Disk Resources

As previously mentioned initially some nominal percentage (e.g., two to five percent) of each DAAC processing disk may be reserved as a safety buffer and the remaining disk space is split among the operating modes as follows:

- OPS – 60%.
- TS1 - 20%.
- TS-2 - 20%.

The procedure for defining disk resources is subordinate to the procedures for adding a resource and modifying a resource. The disk resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining Disk Resources

- 1 On the **Resource Editor** click and hold the **Resource Type** option button, then select **Disk** from the option menu that is displayed.
- 2 Click on the **New...** button.
 - The **Disk Partition Details** GUI (Figure 7) is displayed.
- 3 Type the name of the disk resource to be added to the list of available resources in the **Disk Partition Details** GUI **Resource Name** field.
 - For example, one of the disk resources for the OPS mode at the Goddard Space Flight Center (GSFC) DAAC might be identified as **g0spg01_disk OPS**.
- 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
 - Currently the following activities are available:
 - **groundevent.**
 - **production.**
 - **test.**

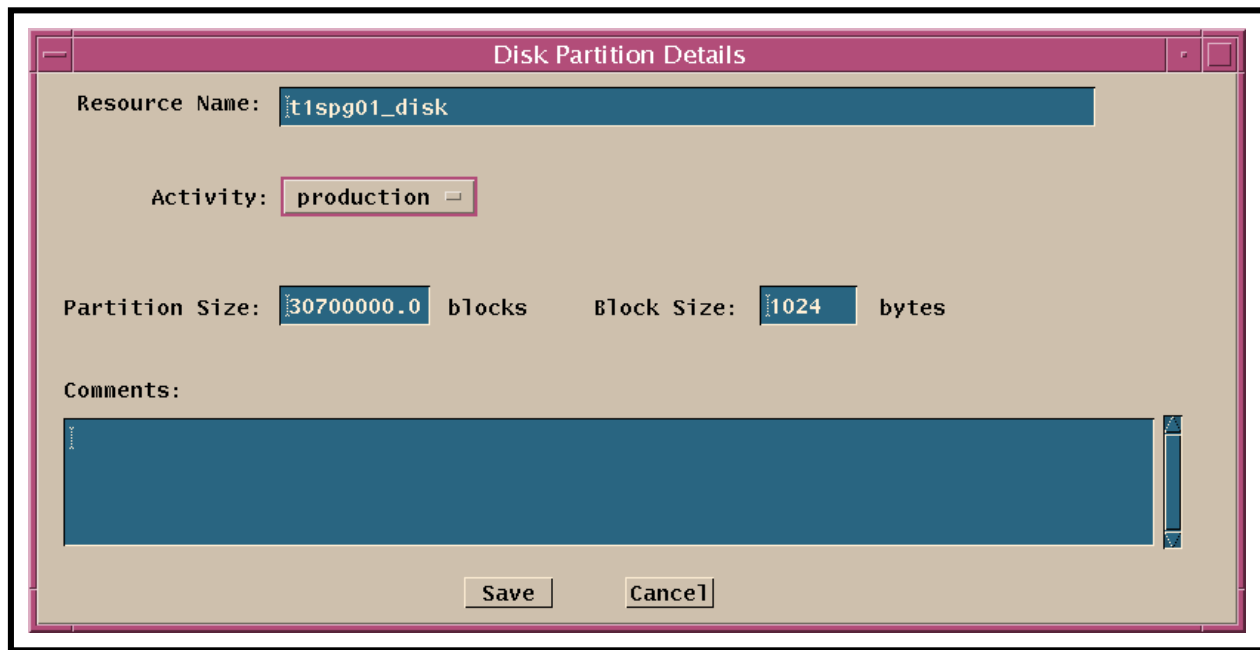


Figure 7. Disk Partition Details GUI

- 5 Type the specified data concerning the disk resource in the following fields:
 - **Partition Size** - size of the disk partition, in **megabytes** (mandatory entry).
 - Although the GUI may indicate that the partition size should be entered in terms of the number of blocks, in fact partition size is to be entered in megabytes.
 - The partition size represents the amount of the total disk space to be allocated to the mode in which the Resource Planning GUIs were launched.
 - For example, if the resources for OPS mode are being defined (the Resource Planning GUIs were launched in OPS mode) and 240,595.708 megabytes were to be allocated to OPS mode, the number 240595.708 would be entered in the **Partition Size** field.
 - **Block Size** - block size (in bytes) used for the disk; enter **1024** (mandatory entry).
 - **Comments** - relevant comments on the resource (e.g., total disk space, amount reserved as a safety buffer, and percentage allocated to the applicable mode).
- 6 When all data concerning the disk resource to be added have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the disk resource data and return to the **Resource Editor**.
 - **Cancel** - to return to the **Resource Editor** without saving the disk resource data.

Defining Virtual Computer Resources

The procedure for defining virtual computer resources is subordinate to the procedures for adding a resource and modifying a resource. The virtual computer resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining Virtual Computer Resources

- 1 On the **Resource Editor** click and hold the **Resource Type** option button, then select **Computer** from the option menu that is displayed.
- 2 Click on the **New...** button.
 - The **[Virtual] Computer Details** GUI (Figure 8) is displayed.
 - The **Computer Details** GUI shows several fields, including the following pair of lists:
 - **Disks** - A list of the disks previously defined for the site.
 - **Associated Disks** - List of disks that are associated with the computer.
- 3 Type the name of the computer resource to be added to the list of available resources in the **Computer Details** GUI **Resource Name** field.
 - For example, a virtual computer at the GSFC DAAC might be identified as **g0spg01_vc_OPS**.
- 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
- 5 Type the specified data concerning the virtual computer resource in the following fields:
 - **Number of CPUs** - Number of central processing units (CPUs) in the virtual computer (e.g., 9) (mandatory entry).
 - **Total RAM** - Virtual computer's total RAM in megabytes (e.g., 1228) (mandatory entry).
 - **Operating System** - Name and version of the computer's operating system (e.g., IRIX64.6.2) (mandatory entry).
- 6 Move disk resources between the **Disks** and **Associated Disks** lists as necessary by selecting (highlighting) the disk to be moved, then clicking on the right or left arrow button (as applicable) to move the disk to the other list.
 - Highlighted disk disappears from one list and appears on the other.
- 7 Type any relevant comments in the **Comments** field (e.g., allocation of CPUs and RAM among modes).

Computer Details

Resource Name:

Activity:

Number of CPUs:

Total Ram: megabytes

Operating System:

Disks

Associated Disks

Comments:

Figure 8. [Virtual] Computer Details GU

- 8 When all data concerning the virtual computer resource to be added have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the virtual computer resource data and return to the **Resource Editor**.
 - **Cancel** - to return to the **Resource Editor** without saving the virtual computer resource data.
- 9 Repeat Steps 1 through 8 for each additional virtual computer (if any) to be defined for the mode.

Defining Real Computer Resources

As previously mentioned each “real” computer is divided into “virtual” computers. The virtual computers are allocated among the operational modes. A real computer is defined in terms of virtual computers.

The procedure for defining real computer resources is subordinate to the procedures for adding a resource and modifying a resource. The real computer resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining Real Computer Resources

- 1 Click and hold on the **Resource Editor** GUI **Resource Type** option button, then select **Real Computer** from the option menu that is displayed.
 - 2 Click on the **New...** button.
 - The **Real Computer Details** GUI (Figure 9) is displayed.
 - The **Real Computer Details** GUI shows several fields, including the following pair of lists:
 - **Computers** - A list of virtual computers previously defined for the site.
 - **Associated Computers** - List of virtual computers that are associated with the real computer.
 - 3 Type the name of the real computer resource to be added to the list of available resources in the **Real Computer Details** GUI **Resource Name** field.
 - For example, one of the real computers at the GSFC DAAC might be identified as **g0spg01**.
 - 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
 - 5 Move computer resources between the **Computers** and **Associated Computers** lists as necessary by selecting (highlighting) the computer to be moved, then clicking on the right or left arrow button (as applicable) to move the computer to the other list.
 - Highlighted computer disappears from one list and appears on the other.
 - 6 Type any relevant comments in the **Comments** field.
 - 7 When all data concerning the real computer resource to be added have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the real computer resource data and return to the **Resource Editor**.
 - **Cancel** - to return to the **Resource Editor** without saving the real computer resource data.
-

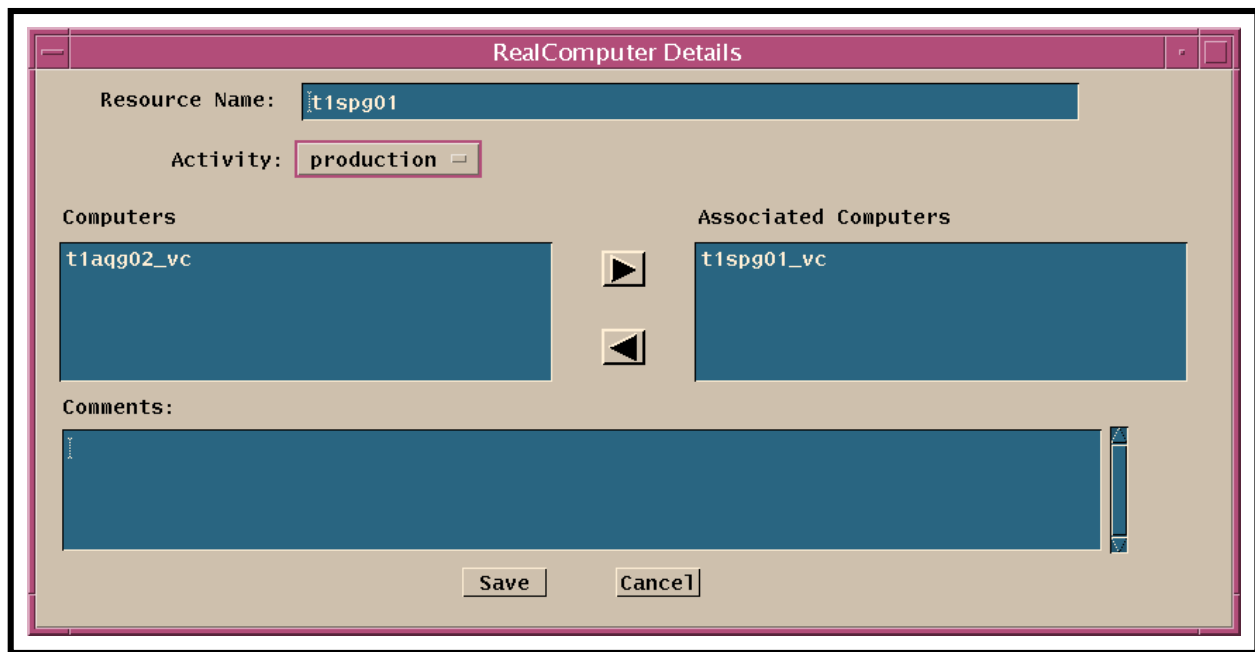


Figure 9. Real Computer Details GUI

Defining String Resources

The procedure for defining string resources is subordinate to the procedures for adding a resource and modifying a resource. The string resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining String Resources

- 1 Click and hold on the **Resource Editor** GUI **Resource Type** option button, then select **String** from the option menu that is displayed.
- 2 Click on the **New...** button.
 - The **String Details** GUI (Figure 10) is displayed.
 - The **String Details** GUI shows several fields, including the following pair of lists:
 - **Computers** - A list of computers previously defined for the site.
 - **Associated Computers** - List of computers that are associated with the string.

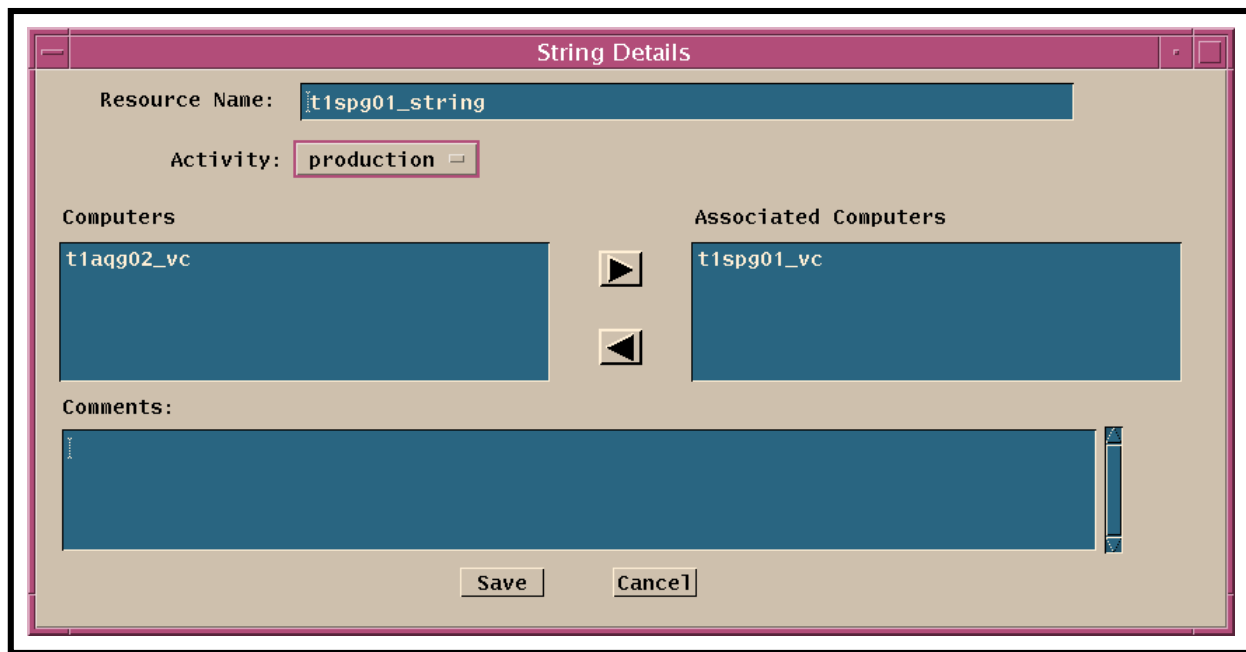


Figure 10. String Details GUI

- 3 Type the name of the string resource to be added to the list of available resources in the **String Details** GUI **Resource Name** field.
 - For example, a string at the GSFC DAAC might be identified as **string_OPS**.
- 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
- 5 Move computer resources between the **Computers** and **Associated Computers** lists as necessary by selecting (highlighting) the computer to be moved, then clicking on the right or left arrow button (as applicable) to move the computer to the other list.
 - Highlighted computer disappears from one list and appears on the other.
 - If a dual science processor configuration is being defined, multiple virtual computers are associated with the string resource.
 - For example, string_OPS at the GSFC DAAC might have the associated computers g0spg01_vc_OPS and g0spg07_vc_OPS.
- 6 Type any relevant comments in the **Comments** field.
- 7 When all data concerning the string resource to be added have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the string resource data and return to the **Resource Editor**.

- **Cancel** - to return to the **Resource Editor** without saving the string resource data.
-

Defining AutoSys Resources

The procedure for defining AutoSys resources is subordinate to the procedures for adding a resource and modifying a resource. The AutoSys resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining AutoSys Resources

- 1 Click and hold on the **Resource Editor** GUI **Resource Type** option button, then select **Autosys** from the option menu that is displayed.
- 2 Click on the **New...** button.
 - The **Autosys Details** GUI (Figure 11) is displayed.
 - The **Autosys Details** GUI shows several fields, including the following pair of lists:
 - **Strings** - A list of previously defined strings (sets of computers).
 - **Associated Strings** - List of sets of computers that are associated with the AutoSys resource.
- 3 Type the name of the AutoSys resource to be added to the list of available resources in the **Autosys Details** GUI **Resource Name** field.
 - For example, an AutoSys resource at the GSFC DAAC might be identified as **FMR**.
 - **AutoSys** resources are identified by three capital letters that specify an AutoSys instance installed as part of the Data Processing Subsystem.
- 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
- 5 Move string resources between the **Strings** and **Associated Strings** lists as necessary by selecting (highlighting) the string to be moved, then clicking on the right or left arrow button (as applicable) to move the string to the other list.
 - Highlighted string disappears from one list and appears on the other.
- 6 Type any relevant comments in the **Comments** field.
- 7 When all data concerning the AutoSys resource being defined have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the AutoSys resource data and return to the **Resource Editor**.

- **Cancel** - to return to the **Resource Editor** without saving the AutoSys resource data.
-

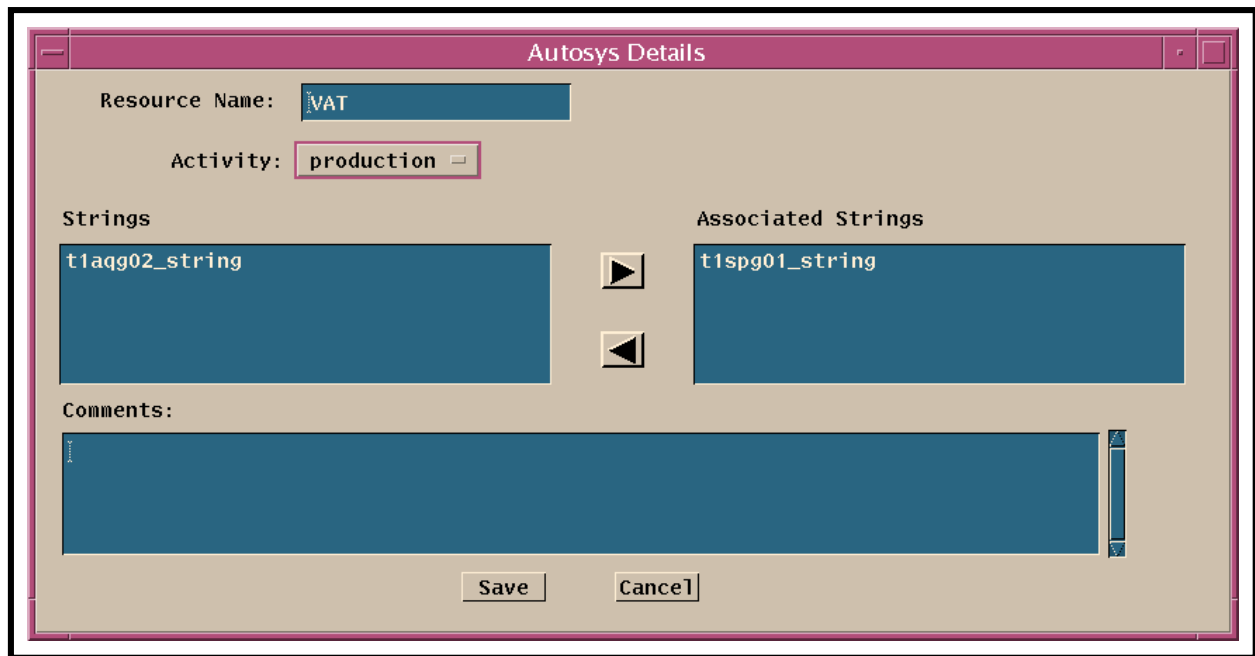


Figure 11. Autosys Details GUI

Defining Hardware Resources

The procedure for defining hardware resources is subordinate to the procedures for adding a resource and modifying a resource. The hardware resources definition procedure starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Defining Hardware Resources

- 1 Click and hold on the **Resource Editor** GUI **Resource Type** option button, then select **Hardware** from the option menu that is displayed.
- 2 Click on the **New...** button.
 - The **Hardware Resource Details** GUI (Figure 12) is displayed.

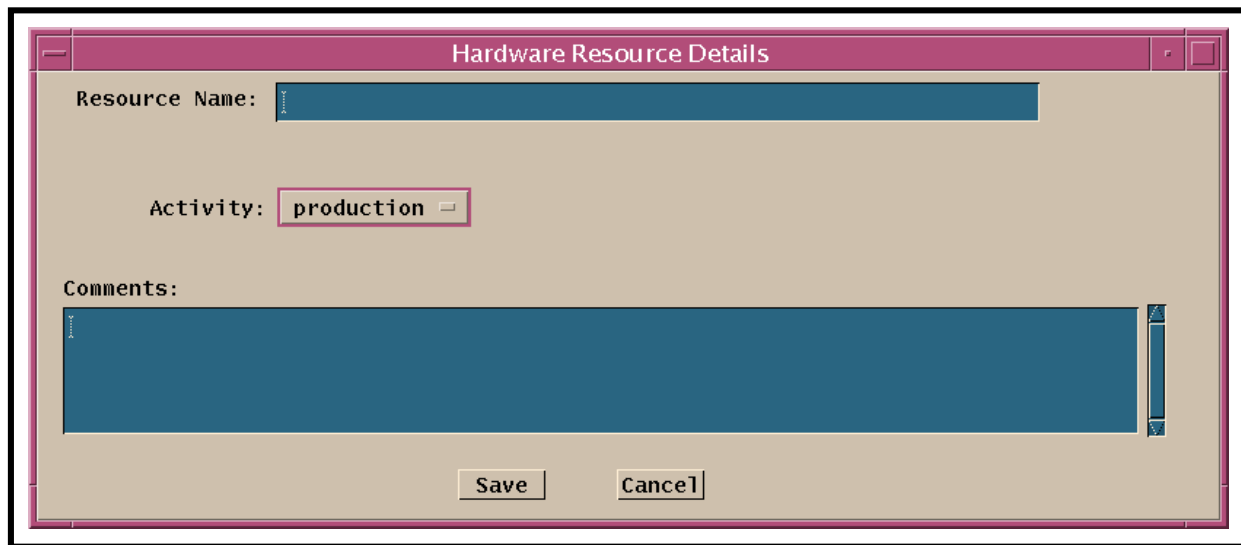


Figure 12. Hardware Resource Details GUI

- 3 Type the name of the hardware resource to be added to the list of available resources in the **Hardware Resource Details** GUI **Resource Name** field.
 - For example, a compact disk read-only memory (CD-ROM) drive associated with computer g0spg01 at the GSFC DAAC might be identified as **g0spg01_cdrom_OPS**.
- 4 If the system-generated default activity (indicated on the **Activity** option button) needs to be changed, click and hold on the **Activity** button and select (highlight then release the mouse button) the appropriate category of activity from the option menu that is displayed.
- 5 Type any relevant comments concerning the resource in the **Comments** field.
- 6 When all data concerning the hardware resource to be added have been entered in the correct fields, click on the appropriate button from the following selections:
 - **Save** - to save the hardware resource data and return to the **Resource Editor**.
 - **Cancel** - to return to the **Resource Editor** without saving the hardware resource data.

Modifying a Resource

The procedures for modifying a resource involve making changes to any of the various types of resources (e.g., computers, disks, strings) on the resource planning list using the same GUIs that are used for adding resources. The procedure for modifying a resource starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Modifying a Resource

- 1 Select (highlight) the resource to be modified in the **Resource Name** list displayed on the **Resource Editor**, then click on the **Modify...** button to gain access to the appropriate resource details GUI.
 - The type of resource selected determines which of the following GUIs appears when the **Modify...** button is activated:
 - **Disk.**
 - **Computer [virtual computer].**
 - **String.**
 - **Real Computer.**
 - **Autosys.**
 - **Hardware.**
 - 2 Make desired changes to the fields of the GUI as necessary in accordance with the applicable steps of the appropriate procedure from the following list:
 - **Defining Disk Resources.**
 - **Defining Virtual Computer Resources.**
 - **Defining Real Computer Resources.**
 - **Defining String Resources.**
 - **Defining AutoSys Resources.**
 - **Defining Hardware Resources.**
-

Deleting a Resource

The procedure for deleting a resource starts with the assumption that the Resource Planner has launched the **Resource Editor** (Figure 4) and the GUI is currently being displayed.

Deleting a Resource

- 1 Select (highlight) the resource to be deleted in the **Resource Name** list displayed on the **Resource Editor**, then click on the **Delete** button.
 - A pop-up dialogue box appears with the message, “**Confirm deleting selected resource?**”
- 2 Click on the appropriate button from the following selections:
 - **Ok** - to delete the resource and dismiss the dialogue box.

- **Cancel** - to leave the **Resource Definition** list unchanged and dismiss the dialogue box.
-

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Creating a Resource Reservation Request

Creating a Resource Reservation Request

The person who needs to use resources for non-routine activities makes a resource reservation request that includes the following information:

- activity for which the reservation request is being made.
- resources to be dedicated to the activity.
- when/how often the activity will occur.

When the requester has submitted a resource reservation request, it is reviewed by the Resource Planner and may be evaluated by a “sponsor” who either validates (determines that the specified resources are appropriate for the proposed activity) or rejects the request.

The procedure for creating a resource reservation request starts with the assumption that the person who will be generating the request has launched the **Resource Scheduler** (Figure 5) and the GUI is currently being displayed.

Creating a Resource Reservation Request

- 1 From the Resource Scheduler, click on the **New...** button to gain access to the **Resource Reservation Request Edit/Definition** GUI.
 - The **Resource Reservation Request Edit/Definition** GUI (Figure 13) is displayed.
 - 2 Type a name for the resource request in the **Request Name** field (**Resource Reservation Request Edit/Definition** GUI).
 - **Request Name** is a mandatory entry.
 - Spaces are allowed in entries made in this field.
 - Naming conventions (if any) for resource reservation requests depend on DAAC policy.
- NOTE:** The Planning Subsystem automatically fills in the **Edited Date** (date of request entry) field (you do not have to make an entry in the field).
- 3 Type the identification of the person making the resource reservation request in the **Originator** field.
 - **Originator** is a mandatory entry.
 - Spaces are allowed in entries made in this field.

Resource Reservation Request Edit/Definition – New

Request Name:

Edited Date: 04/20/1999 At 14:12:00

Originator:

Sponsor:

Activity: Priority: 0

Description:

Start Day as "MM/DD/YYYY" 04/20/1999 Start Time as "HH:MM:SS" 14:12:00

Stop Day as "MM/DD/YYYY" 04/20/1999 Stop Time as "HH:MM:SS" 14:12:00

Frequency:

☐ Rejected ☐ Validated Status:

Comments:

Figure 13. Resource Reservation Request Edit/Definition GUI

- Either UserID or actual name of a person may be used, depending on DAAC policy (if applicable).
- 4 Type the identification of the person sponsoring the resource reservation request in the **Sponsor** field.
- **Sponsor** is a mandatory entry.
 - Spaces are allowed in entries made in this field.
 - If appropriate, the same individual may be listed as both **Originator** and **Sponsor** (at least initially).
- 5 If the type of activity currently displayed on the **Activity** option button is not accurate, click and hold on the **Activity** option button and select (highlight then release the mouse button) the proper activity from the option menu that is displayed.
- The following activities are currently available:
 - **production.**
 - **test.**
 - **groundevent.**
- 6 Slide the **Priority** slide to the right to select the appropriate priority for the resource reservation request.
- The **Priority** scale is numbered from 0 to 100.
 - The higher the number selected, the lower the priority.
 - 1 denotes the highest priority.
 - 100 designates the lowest priority.
- 7 Type a description of the specific activity for which the resource is required in the **Description** field.
- For example, if **Test** was selected as the **Activity**, “Version 2.0 Test TS0420” might be entered in the **Description** field to describe the particular test to be performed using the requested resources.
 - **Description** is a mandatory entry.
 - The entry in this field is displayed on the Resource Reservation Planning Master Timeline GUI if the resource reservation is eventually approved and committed as part of the resource plan.
 - No more than 31 characters can be entered in the **Description** field; if more space is needed, use the **Comments** field.

8 Perform the procedure for **Selecting Resources** (subsequent section of this lesson).

- Resource selection is mandatory.

NOTE: The **Interval...** button is used for deselecting periods of time (if any) when the requested resources are **not** needed during the period(s) of time defined by the duration and frequency specified on the resource reservation request. The resource reservation request has to be saved before intervals can be adjusted. Consequently, the procedure for Deselecting Intervals is subordinate to the procedure for **Editing a Resource Reservation Request** and is discussed in a subsequent section of this lesson.

9 Type duration information in the following fields (to define the period over which the resource is required), pressing the **Tab** key on the keyboard after completing each entry to move to the next field:

- **Start Day** - start date of the resource request period (in *MM/DD/YYYY* format - mandatory entry).
- **Start Time** - start time of the resource request period (in *hh:mm:ss* format - mandatory entry).
- The **Start Time** must be later than the time when the resource reservation request will be saved; otherwise, it will not be possible to save the request.
- **Stop Day** - stop date of the resource request period (in *MM/DD/YYYY* format - mandatory entry).
- **Stop Time** - stop time of the resource request period (in *hh:mm:ss* format - mandatory entry).
- If a reservation is to be repeated at intervals (with some frequency), the **Stop Day** specifies the end date in the date range of the reservation request.

10 Perform the procedure for **Selecting Frequency** (subsequent section of this lesson).

- The **frequency** selection involves identifying those periods of time when the requested resources are needed for the specified activity.
- The default frequency is **Once**.

NOTE: Leave the selections **Validated** and **Rejected** for the sponsor's evaluation (to be discussed in a subsequent section of this lesson).

NOTE: The **Status** field indicates **new** when a new resource reservation request is being prepared. No entry is required in this field.

11 Type comments concerning the resource reservation request in the **Comments** field.

12 After the appropriate data have been entered in the resource reservation request fields, click on the appropriate button:

- **Save** - to save the resource reservation request.

- **Clear** - to clear entries for starting over. Once cleared, the entries are deleted from the system.
 - **Cancel** - to exit the **Resource Reservation Request Edit/Definition** GUI without saving the request.
-

Selecting Resources

The **Resource...** button on the **Resource Reservation Request Edit/Definition** GUI provides the person submitting the request with a means of specifying the resources to be assigned to the particular resource reservation request. Upon clicking on the **Resource...** button a **Resources Selection** GUI with the following pair of lists is displayed:

- **Resources** - identifies the available resources.
- **Selected Resources** - identifies the resources that have been selected for incorporation in the resource reservation request.

The person submitting the request selects resources by moving resources from one list to the other until the **Selected Resources** list contains the desired set of resources. The requester highlights each resource to be moved and clicks on the appropriate arrow button to make the transfer.

The procedure for selecting resources starts with the assumption that the person submitting the request has launched the **Resource Planning** tool and the **Resource Reservation Request Edit/Definition** GUI (Figure 13) is currently being displayed.

Selecting Resources

- 1 Click on the **Resource...** button to gain access to the **Resources Selection** GUI.
 - The **Resources Selection** GUI (Figure 14) is displayed.
 - The **Request Name** field is blank and is to remain empty.
 - The **Resources Selection** GUI shows a pair of lists.
 - **Resources** - itemizes the available resources.
 - **Selected Resources** - itemizes the resources that have been selected for incorporation into the resource reservation.
- 2 Move resources (as necessary) between the **Resources** and **Selected Resources** lists on the **Resources Selection** GUI by selecting (highlighting) the resource to be moved (click on the resource in the list from which it is to be moved) then clicking on the right or left arrow button (as applicable) to move the resource to the other list.
 - Highlighted resource disappears from one list and appears on the other.



Figure 14. Resources Selection GUI

- 3 When the appropriate data have been entered in the resource fields, click on the appropriate button from the following selections:
 - **Ok** - to save the selections, exit the **Resources Selection** GUI and return to the **Resource Reservation Request Edit/Definition** GUI.
 - **Cancel** - to exit the **Resources Selection** GUI and return to the **Resource Reservation Request Edit/Definition** GUI without saving the selected resources.
 - 4 Return to the procedure for **Creating a Resource Reservation Request** or the procedure for **Editing a Resource Reservation Request** (as applicable) and go to the next step in the process of defining the resource reservation request.
-

Selecting Frequency

The **Frequency** option button on the **Resource Reservation Request Edit/Definition** GUI (Figure 13) allows the user to specify whether the resource reservation request describes a one-time event or a recurring event. Furthermore, the **Frequency** button provides options for periodic resource requests; i.e., to specify how often a repeating resource need will occur. Several options for specifying the frequency are available in the **Frequency** option menu and there is a text field in which the person making the request enters a qualifier for certain frequencies. The default frequency is **Once**, which indicates that the resource need covers the entire time period between the 'Start Time' and 'Stop Time' (if the request is for one day only, a single Start Date is required for the **Once** option only). Other options are identified in Table 2,

Frequency List and Qualifiers. The frequency data are applied to the resources specified in the **Selected Resources** list box (described in the preceding section).

Table 2. Frequency List and Qualifiers

Frequency	Text Qualifier	Result
Once	--	The default. Resource reservation covering the period between the start time and stop time for the start/stop date specified.
Daily	--	Resource reservation for every day, between the start date and end date, for the start time and end time specified.
Weekly		Resource reservation for every week on the start day of the week between the start time and end time specified, repeated every week until the specified end date.
Every_2_weeks		Resource reservation for every two weeks on the start day of the week between the start time and end time specified, repeated every two weeks until the specified end date.
Monthly	--	Resource reservation for every month on the start day of the month, repeated until the end date as specified.
Mon_thru_Fri	--	Resource reservation for every Monday through Friday, between the start date and end date, for the start time and end time specified.
Mon_Wed_Fri	--	Resource reservation for every Monday, Wednesday, and Friday, between the start date and end date, for the start time and end time specified.
Tues_Thurs	--	Resource reservation for every Tuesday and Thursday, between the start date and end date, for the start time and end time specified.
Every_?_Days	n	Resource reservation for every n days, between the start date and end date, for the start time and end time specified.
Weekend	--	Resource reservation for every Saturday and Sunday, between the start date and end date, for the start time and end time specified.

The procedure for selecting resources starts with the assumption that the person submitting the resource reservation request has launched the **Resource Planning** tool and the **Resource Reservation Request Edit/Definition** GUI (Figure 13) is currently being displayed.

Selecting Frequency

- 1 Click and hold on the **Frequency** option button on the **Reservation Request Edit/Definition** GUI and select (from the option menu that is displayed) the appropriate frequency to be applied to the resource reservation request.
 - The frequency options on the menu are shown in Table 2, Frequency List and Qualifiers.
 - 2 If **Every ? Days** was selected as the frequency, type the number of days between actions in the field to the right of the **Frequency** button.
 - 3 Return to the procedure for **Creating a Resource Reservation Request** or the procedure for **Editing a Resource Reservation Request** (as applicable) and go to the next step in the process of defining the resource reservation request.
-

Editing a Resource Reservation Request

Editing a Resource Reservation Request

During the process of evaluating resource reservation requests to validate and approve them and achieve a conflict-free resource plan, it may be necessary to edit some of the resource reservation requests. For example, any of the following factors may lead to the modification of a resource reservation request:

- activities related to evaluation of the resource reservation request for validation purposes.
- change in the activity/event for which a resource reservation request was prepared.
- addition or deletion of resources.
- modification of intervals for recurring ground events.
- resource conflicts.

Before editing a resource reservation request, the person editing the request must be able to provide the same types of information that were required for making the initial request (including the appropriate changes to be made). In addition, the person editing the request must know which request is to be edited.

The procedure for editing a resource reservation request starts with the assumption that the person editing the request has launched the **Resource Scheduler** (Figure 5), which is currently being displayed.

Editing a Resource Reservation Request

- 1 If the resource reservation request to be edited is not included in the list displayed on the **Resource Scheduler**, click and hold on the **Activity Type** option button and select the appropriate category of activity (or select **All**) from the option menu that is displayed.
- 2 From the **Resource Scheduler**, highlight (click on) the resource reservation request you want to modify then click on the **Modify...** button to access the **Resource Reservation Request Edit/Definition** GUI.
 - The **Resource Reservation Request Edit/Definition** GUI (Figure 13) containing the data for the selected resource reservation request is displayed.
- 3 Observe the **Resource Reservation Request Edit/Definition** GUI **Status** field, which indicates the current status of the reservation request.
 - **Status** is a Planning Subsystem-generated entry based on user input in other fields.

- **Status** field may indicate “new,” “validated,” “rejected,” “approved,” “committed,” etc.
- 4 If assigning a sponsor to evaluate (validate) the resource reservation request, type the sponsor’s User ID in the Sponsor field.
 - 5 If changing the selection of resource(s), perform the procedure for **Selecting Resources** (previous section of this lesson).
 - 6 If making an interval adjustment, perform the procedure for **Deselecting Interval** (subsequent section of this lesson).
 - The **interval** selection involves identifying those periods of time (if any) when the requested resources are **not** needed during the period(s) of time defined by the duration and frequency specified on the resource reservation request.
 - 7 If making a frequency adjustment, perform the procedure for **Selecting Frequency** (previous section of this lesson).
 - 8 Make modifications by completing Steps 5 through 11 (as necessary) of the procedure for **Creating a Resource Reservation Request**.
 - Make changes in the following fields as necessary:
 - **Activity.**
 - [Activity] **Description.**
 - **Start Day.**
 - **Stop Day.**
 - **Start Time.**
 - **Stop Time.**
 - **Comments.**
 - **Status** will revert to **new** when the edited resource reservation request is saved if certain types of modifications have been made (e.g., changes in the selected resources or start/stop date/time).
 - 9 If appropriate at this time, click on either the **Validated** button or the **Rejected** button.
 - If evaluating the request as a sponsor.
 - Refer to the procedure for **Validating or Rejecting a Resource Reservation Request** (a subsequent section of this lesson).
 - 10 After the appropriate data have been entered in the resource reservation request fields, click on the appropriate button(s) from the following selections:
 - **Save** - to save the modified resource reservation request and dismiss the **Resource Reservation Request Edit/Definition** GUI.

- **Clear** - to clear entries for starting over without dismissing the **Resource Reservation Request Edit/Definition** GUI. Once cleared, the entries are deleted from the system.
 - **Cancel** - to exit the **Resource Reservation Request Edit/Definition** GUI without saving the modified request.
-

Deselecting Interval

The **Interval...** button on the **Resource Reservation Request Edit/Definition** GUI (Figure 13) allows the person editing the resource reservation request to tailor a **frequency-based** request by overriding selected intervals. When the requester clicks on the **Interval...** button, a **Resource Reservation Intervals Selection** GUI (Figure 15) with the following pair of lists is displayed:

- **Selected Intervals** – initially identifies the dates applicable to the resource reservation request as automatically generated by the Planning Subsystem, based upon the duration and frequency information entered (as described in preceding sections).
- **Unselected Intervals** - the person modifying the resource reservation request selects the date(s), if any, from among the automatically generated intervals to identify when the requested resources will **not** be needed for the activity for which the resource reservation request was prepared.

The procedure for deselecting intervals starts with the assumption that the person modifying the resource reservation request has launched the **Resource Planning** tool and the **Resource Reservation Request Edit/Definition** GUI (Figure 13) containing the data for the selected resource reservation request is currently being displayed.

Deselecting Intervals

- 1 Click on the **Interval...** button on the **Resource Reservation Request Edit/Definition** GUI to gain access to the **Intervals Selection** GUI.
 - The **Intervals Selection** GUI (Figure 15) is displayed.
 - The **Intervals Selection** GUI shows the following pair of lists:
 - **Unselected Intervals** - lists dates (if any) that do **not** need to be reserved for the resource reservation request.
 - **Selected Intervals** - identifies the applicable dates for the resource reservation request (initially automatically generated by the system based upon the duration and frequency information entered).

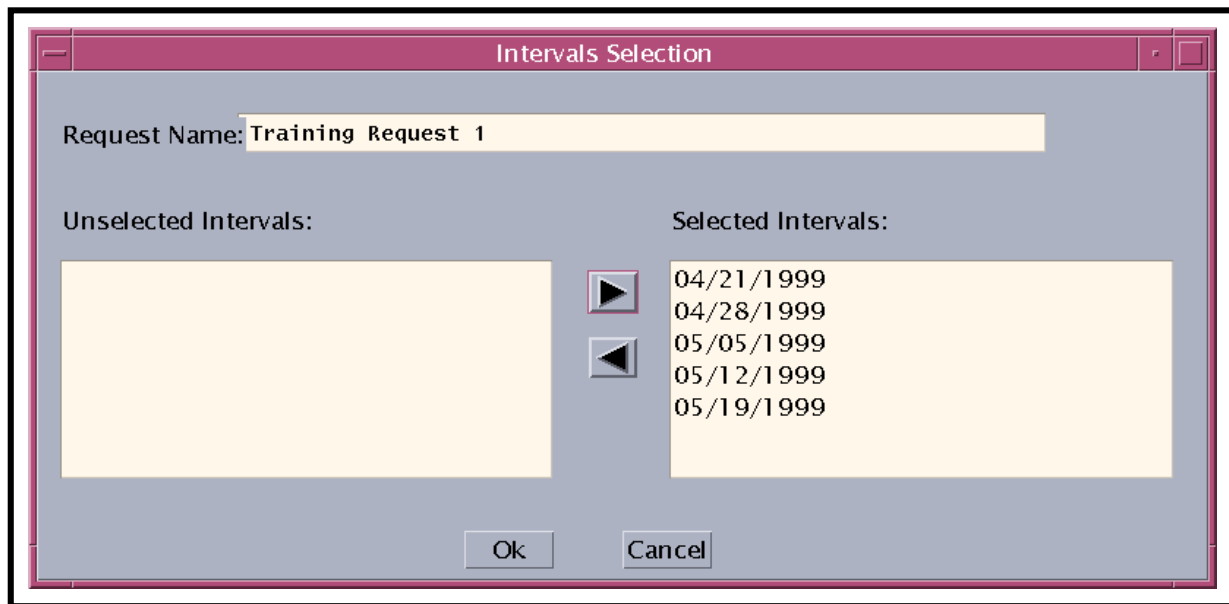


Figure 15. Resource Reservation Intervals Selection GUI

- 2 Move dates (as necessary) between the **Unselected Intervals** and **Selected Intervals** lists on the **Intervals Selection** GUI by selecting (highlighting) the date to be moved (click on the date in the list from which it is to be moved) then clicking on the right or left arrow button (as applicable) to move the date to the other list.
 - Highlighted date disappears from one list and appears on the other.
 - 3 When the appropriate data have been entered in the interval fields, click on the appropriate button from the following selections:
 - **OK** - to save the selections, exit the **Intervals Selection** GUI and return to the **Resource Reservation Request Edit/Definition** GUI.
 - **Cancel** - to exit the **Intervals Selection** GUI and return to the **Resource Reservation Request Edit/Definition** GUI without saving the selections.
 - 4 Return to the procedure for **Editing a Resource Reservation Request** and go to the next step in the process of modifying the resource reservation request.
-

Validating or Rejecting a Resource Reservation Request

All resource reservation requests must be validated and approved before scheduling. Validation is the process by which a request is checked to ensure that it is complete and reasonable (requested resources are appropriate for the stated activity).

After reviewing a resource reservation request, the Resource Planner may choose to consult with appropriate DAAC staff or assign a staff member (“sponsor”) to validate the request. When a resource reservation request has been evaluated by a sponsor and either validated or rejected, the status of the request, as viewed on the **Resource Scheduler** (Figure 5), changes to the newly assigned status.

Before evaluating a resource reservation request for the purpose of validating or rejecting it, the evaluator (sponsor) must know which request is to be evaluated.

The procedure for validating or rejecting a resource reservation request starts with the assumption that the sponsor has launched the **Resource Planning** tool and the **Resource Scheduler** (Figure 5) is currently being displayed.

Validating or Rejecting a Resource Reservation Request

- 1 If the desired resource reservation request is not included in the list displayed on the **Resource Scheduler**, click and hold on the **Activity Type** option button and select the appropriate category of activity (or select **All**) from the option menu that is displayed.
- 2 From the **Resource Scheduler**, highlight (click on) the resource reservation request to be validated.
- 3 Click on the **Modify...** button to gain access to the **Resource Reservation Request Edit/Definition** GUI.
 - The **Resource Reservation Request Edit/Definition** GUI (Figure 13) containing the data for the selected resource reservation request is displayed.
- 4 Evaluate the entries in the **Resource Reservation Request Edit/Definition** GUI fields, especially the following fields:
 - **Activity.**
 - **Description.**
 - **Priority.**
 - **Start Day.**
 - **Stop Day.**
 - **Start Time.**
 - **Stop Time.**
 - **Frequency.**
 - **Status.**
 - **Comments.**

- 5 Click on the **Resource...** button.
 - The **Resources Selection** GUI (Figure 14) is displayed.
 - 6 Evaluate the entries in the **Resources** and **Selected Resources** fields.
 - 7 Click on the **Cancel** button.
 - 8 Click on the **Interval...** button.
 - The **Interval Selection** GUI (Figure 15) is displayed.
 - 9 Evaluate the entries in the **Unselected Intervals** and **Selected Intervals** fields.
 - 10 Click on the **Cancel** button.
 - 11 Click on either the **Validated** button or the **Rejected** button as appropriate.
 - **Validated** indicates that the resource reservation request is complete and “makes sense;” i.e., the request includes the appropriate resources consistent with the type of activity that is being proposed.
 - **Rejected** indicates that the resource reservation request is not acceptable as submitted.
 - 12 If appropriate, update the **Comments** field by typing relevant comments concerning the resource reservation request, especially reasons for rejection.
 - 13 After the appropriate data have been entered in the resource reservation request fields, click on the appropriate button(s):
 - **Save** - to save the modified resource reservation request and dismiss the **Resource Reservation Request Edit/Definition** GUI.
 - **Clear** - to clear entries without dismissing the **Resource Reservation Request Edit/Definition** GUI. Once cleared, the entries are deleted from the system.
 - **Cancel** - to exit the **Resource Reservation Request Edit/Definition** GUI without saving the modified request.
-

Approving a Resource Reservation Request

As previously mentioned all resource reservation requests must be validated and approved before scheduling. The resource reservation request approval process has the following general steps:

- The sponsor has validated the resource reservation request (request status is “validated”).
- The Resource Planner changes the status of the resource reservation request to “approved” (enters the approval into the Planning Subsystem).

- The Planning Subsystem checks for conflicts between the resource reservation and other reservations.
- If conflicts are detected...
 - a dialogue box pops up indicating that there are conflicts that must be resolved.
 - the Resource Planner resolves the conflicts (in consultation with the Resource Manager and resource requesters, if necessary), making appropriate modifications to resource reservation requests.
- The Planning Subsystem allows the approval of a resource reservation request only if there are no scheduling conflicts.
- The Resource Manager reviews the set of “approved” resource reservation requests and changes the status of resource reservation requests to “committed” (refer to the next section of the lesson, “Committing a Resource Reservation Request”), which has the effect of activating the resource plan.

When preparing a resource plan for approval and eventual activation, the Resource Planner should consult with the Resource Manager concerning what effects resource reservation requests would have on high-priority activities.

The procedure for approving one or more resource reservation requests starts with the assumption that the Resource Planner has launched the **Resource Planning** tool and the **Resource Scheduler** (Figure 5) is currently being displayed. Furthermore, it is assumed that the Resource Planner knows which resource reservation request(s) should be approved (from among those that have been validated).

Approving a Resource Reservation Request

- 1 If the desired resource reservation request is not included in the list displayed on the **Resource Scheduler**, click and hold on the **Activity Type** option button and select the appropriate category of activity (or select **All**) from the option menu that is displayed.
- 2 Highlight (click on) the resource reservation request to be approved.
- 3 Click on the **Approve** button to request approval from the Planning Subsystem.
 - If there are no resource conflicts resulting from the approval of the resource reservation request, a pop-up dialogue box appears bearing the message, “Success to approve reservation Name: [name].”
 - If there are resource conflicts resulting from the attempt to approve the resource reservation request, a pop-up dialogue box appears indicating that the approval failed and making reference to the **Message Handler** GUI (Figure 3) for further information.

- 4 Click on the **OK** button to collapse the pop-up dialogue box.
 - If there are **no** resource conflicts to be resolved, the entry in the **Status** column of the **Resource Scheduler** indicates that the request is "Approved" (changes from "Validated"). [End of procedure.]
 - If there are resource conflicts to be resolved, the entry in the **Status** column of the **Resource Scheduler** indicates that the request has "Conflicts" (changes from "Validated"). [Continue with Step 5.]
 - 5 If there are resource conflicts to be resolved, examine the information displayed on the **Resource Scheduler**.
 - Although the pop-up dialogue box makes reference to the **Message Handler** GUI for further information, no relevant data seems to be displayed there. Therefore, it is more appropriate to check for conflicts in the duration and frequency information for the resource reservation requests displayed on the **Resource Scheduler**. When more than one resource reservation request is scheduled for the same date and time, there may be a conflict (if the same resource is specified in the requests).
 - It may be necessary to examine individual resource reservation requests in detail. If so, use the procedure for **Editing a Resource Reservation Request**.
 - 6 If necessary, consult with the resource requester(s), Resource Manager and other personnel to determine which resource reservation request(s) to modify or delete in order to create a conflict-free resource plan.
 - 7 If applicable, go to the procedure for **Deleting a Resource Reservation Request** and delete resource reservation request(s) as necessary to resolve the conflicts.
 - 8 If applicable, go to the procedure for **Editing a Resource Reservation Request** and modify/validate resource reservation request(s) as necessary to resolve the conflicts.
 - 9 If applicable, return to Step 1 to approve a modified resource reservation request.
 - The modified procedure must have been "validated." If necessary, refer to the procedure for **Validating or Rejecting a Resource Reservation Request**.
-

Committing Resource Reservation Requests

After resource reservation requests have been validated and approved, and conflicts have been resolved, the following actions are taken:

- Resource Manager determines the effects of the "approved" resource reservation requests on high-priority activities.
- Resource Manager commits the resource reservation requests if reserving the resources will **not** have adverse effects on high-priority activities.

- Planning Subsystem updates the status of “approved” resource reservation requests to “committed” in the PDPS database.
- Data Processing Subsystem schedules “ground events” on the committed resources during the indicated time period(s).

The procedure for committing resource reservation requests starts with the assumption that the Resource Manager has launched the **Resource Planning** tool and the **Resource Scheduler** (Figure 5) is currently being displayed. All resource reservation requests with a status of “Approved” have their status changed to “Committed” at the same time.

Committing Resource Reservation Requests

- 1 If all approved resource reservation requests are not included in the list displayed on the **Resource Scheduler**, click and hold on the **Activity Type** option button and select **All** from the option menu that is displayed.
 - 2 Click on the **Commit globally** button.
 - The entries in the **Status** column for all “Approved” requests change to "Committed."
 - 3 To view a graphical representation of the resource plan go to the procedure for **Reviewing a Resource Timeline** (subsequent section of this lesson).
-

Deleting a Resource Reservation Request

If a resource reservation request is to be deleted (e.g., having been rejected and incapable of being satisfactorily modified), the request can be deleted. The resource reservation request is dropped from the resource reservation request list but is not removed immediately from the PDPS database (although it is assigned a status of “deleted”). Eventually “deleted” resource reservations are removed from the PDPS database through routine database maintenance activities.

The procedure for deleting one or more resource reservation requests starts with the assumption that the Resource Planner or Resource Manager has launched the **Resource Planning** tool and the **Resource Scheduler** (Figure 5) is currently being displayed. Furthermore, it is assumed that the Resource Planner knows which resource reservation request(s) should be deleted (among those listed).

Deleting a Resource Reservation Request

- 1 If the desired resource reservation request is not included in the list displayed on the **Resource Scheduler**, click and hold on the **Activity Type** option button and select the appropriate category of activity (or select **All**) from the option menu that is displayed.
- 2 Highlight (click on) the resource reservation request to be deleted.

- 3 Select **File → Delete** from the **Resource Scheduler** pull-down menu.
- The entry for the resource reservation request is deleted from the GUI.
-

Reviewing Resource Timelines

Reviewing a Resource Timeline

The Resource Planning software has provisions that allow the operator to view the Resource Plan as a timeline. The timeline display represents a set of resources, arranged along the left side of the screen, and some period of time indicated across the top edge of the screen.

The use of a resource over a period of time is represented by one or more “resource reservation” bars across the screen.

- A bar represents a time period during which a resource reservation has been planned.
- Each bar bears the name of the resource reservation. Given the selection of a light enough color for the bar and a time span that allows a long enough bar, the name of the resource reservation can be seen on the bar.
 - Placing the cursor on a resource reservation bar causes the name of the resource reservation, its description, and its start and end dates/times to appear near the bottom of the timeline GUI.
- At those times when there is no reservation affecting a particular resource, the resource plan makes it available for its default activity.
 - Example: By default all science processors will be used for science processing unless a reservation for some other activity (e.g., maintenance or testing) has been made for a specific science processor.

The procedure for reviewing a resource timeline starts with the assumption that the person who will be reviewing the timeline has launched the **Resource Scheduler** (Figure 5) and the GUI is currently being displayed.

Reviewing a Resource Timeline

- 1 From the **Resource Scheduler** click on the **Timeline** button.
 - The **Resource Reservation Planning Master Timeline** GUI (Figure 16) is displayed.
- 2 Adjust the **Resource Reservation Planning Master Timeline** GUI window size and the view of the timeline as necessary using the mouse.
 - Grab a corner of the timeline window with the cursor and resize the window as desired.
 - Scroll up or down through the full list of resources.

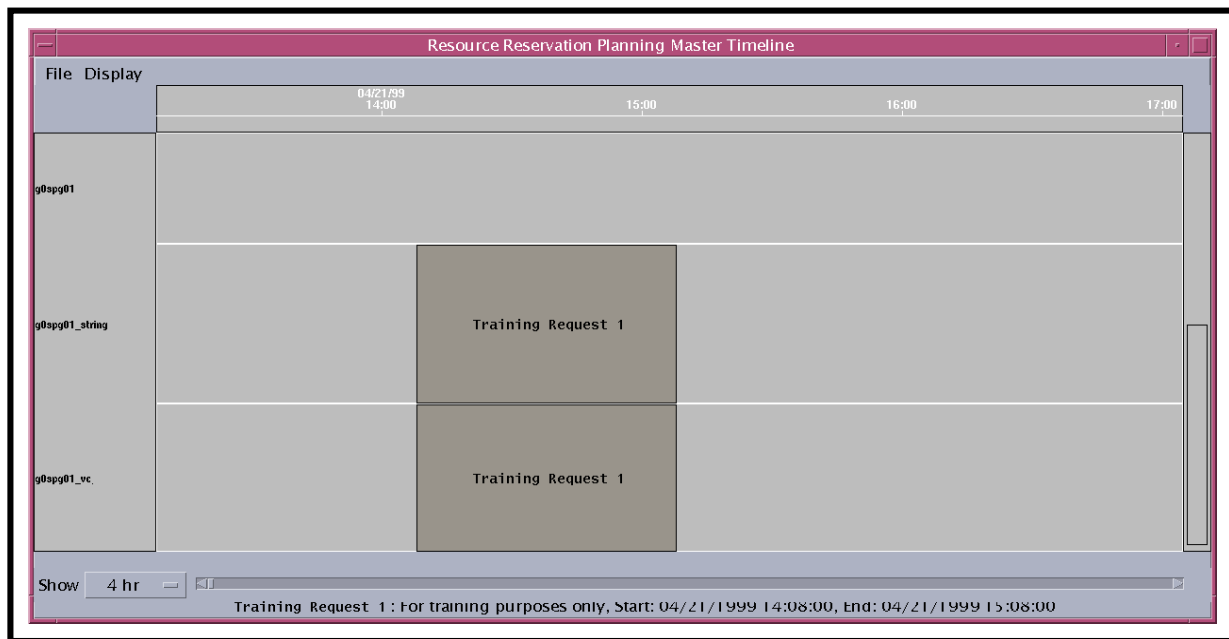


Figure 16. Resource Reservation Planning Master Timeline GUI

- Scroll left or right to go backward or forward in time.
- 3 If a different time scale (start and end dates and times) is desired, perform Steps 4 through 6; otherwise, go to Step 7.
 - 4 Select **Display** → **Change Time Scale** from the pull-down menu:
 - The **plan window edit** window (Figure 17) is displayed.
 - 5 Type date and time for the desired start and end times (in **DD MMM YYYY hh:mm:ss** format) in the **Plan Win Start** and **Plan Win End** fields of the **plan window edit** window.
 - 6 When the appropriate date and time have been entered, click on the appropriate button from the following selections:
 - **OK** - to accept the changes and dismiss the **plan window edit** window.
 - **Apply** - to accept the changes without dismissing the **plan window edit** window.
 - **Cancel** - to cancel the changes and dismiss the **plan window edit** window.



Figure 17. Plan Window Edit Window

- 7 If a different time span is desired, click and hold on the **Show** option button and select (highlight then release the mouse button) the desired time span from the option menu that is displayed:
 - 1 hr
 - 4 hr
 - 8 hr
 - 12 hr
 - 24 hr
 - 48 hr
 - 4 day
 - 1 week
 - 2 week
 - 1 month
 - full scale
- 8 If no resources are displayed on the GUI or if different resources should be displayed, perform Steps 9 through 13; otherwise, go to Step 14.
- 9 Select **Display** → **Change resources** from the pull-down menu:
 - The **Resource edit** window (Figure 18) is displayed.
- 10 If adding resource(s) from the **Available Resources** list to the **Viewed Resources** list, select (highlight) the resource(s) to be added, then click on the **Add** button to move the resource(s) to the **Viewed Resources** list.
 - Highlighted resource(s) appear(s) on the **Viewed Resources** list.

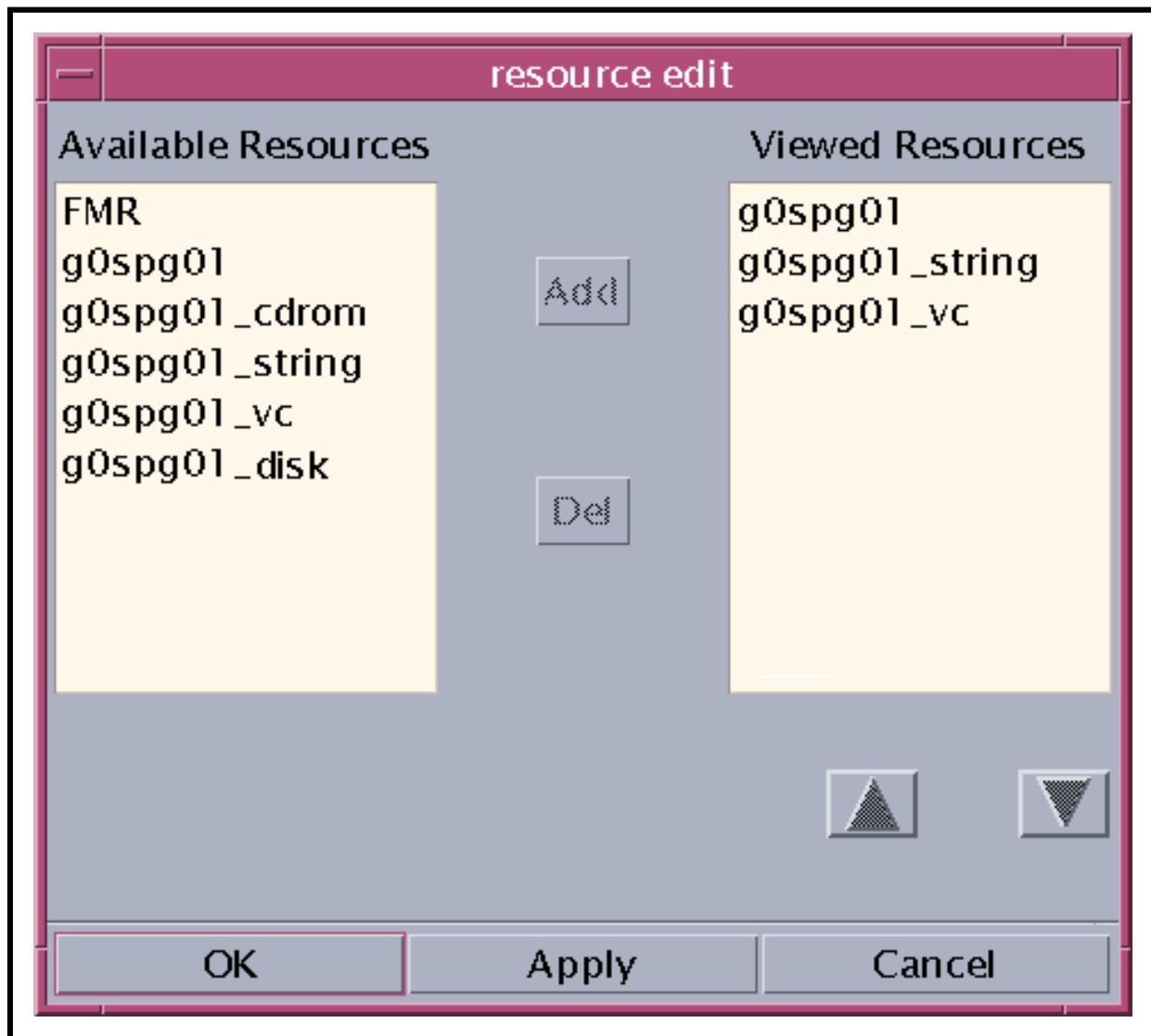


Figure 18. Resource Edit Window

- 11 If deleting resource(s) from the **Viewed Resources** list, select (highlight) the resource(s) to be removed, then click on the **Del** button to remove the resource(s) from the **Viewed Resources** list.
 - Highlighted resource(s) disappear(s) from the **Viewed Resources** list.
- 12 If changing the order in which resources are listed in the **Viewed Resources** list, select (highlight) the resource to be moved, then click on the up or down arrow as necessary to reposition the selected resource.
 - Highlighted resource changes position in the **Viewed Resources** list.

- 13 When the **Viewed Resources** list contains the desired set of resources, click on the appropriate button from the following selections:
 - **OK** - to accept the changes and dismiss the **Resource edit** window.
 - **Apply** - to accept the changes without dismissing the **Resource edit** window.
 - **Cancel** - to cancel the changes and dismiss the **Resource edit** window.
 - 14 If different color coding of the timeline is desired, perform Steps 15 through 19; otherwise, go to Step 20.
 - 15 Select **Display** → **Change colors** from the pull-down menu:
 - The **Color Selections** window (Figure 19) is displayed.
 - 16 Click on the name of one of the resource reservations to be recolored.
 - The resource reservation is highlighted.
 - 17 Click on the desired color (in the color palette) to be applied to the highlighted resource reservation.
 - 18 Repeat Steps 16 and 17 as necessary.
 - 19 When the appropriate color changes have been made, click on the appropriate button from the following selections:
 - **OK** - to accept the changes and dismiss the **Color Selections** window.
 - **Apply** - to accept the changes without dismissing the **Color Selections** window.
 - **Cancel** - to cancel the changes and dismiss the **Color Selections** window.
 - 20 Observe the resource reservation information displayed on the **Resource Reservation Planning Master Timeline** GUI.
 - 21 Repeat the previous steps as necessary.
 - 22 If it becomes necessary to exit from the timeline GUI, select **File** → **Quit** from the pull-down menu.
-

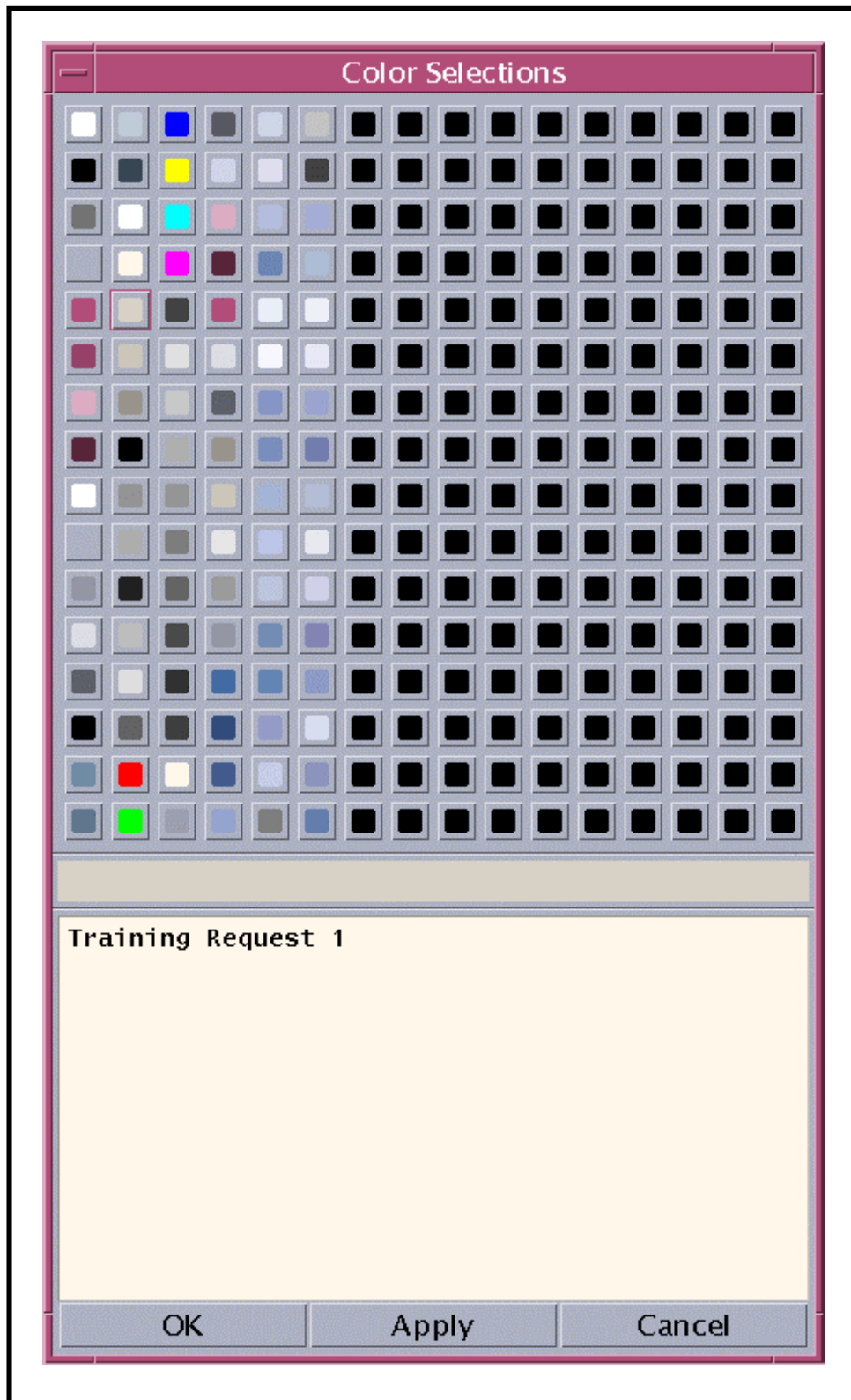


Figure 19. Color Selections Window

Troubleshooting Resource Planning Problems

Trouble Symptoms

Troubleshooting is a process of identifying the source of problems on the basis of observed trouble symptoms. One common source of problems involves the reliance on messages or data from other subsystems. However, unlike many other operational areas in ECS, Resource Planning does not have interfaces with many other subsystems. (The primary exception is the System Management Subsystem (MSS), with which Resource Planning interfaces (through Tivoli) to gain access to baseline information.) Consequently, problems with Resource Planning can usually be traced to either some part of the Planning Subsystem or the ECS infrastructure.

Table 3 describes actions to be taken in response to some common Resource Planning problems. If the problem cannot be identified and fixed without help within a reasonable period of time, the appropriate response is to call the help desk and submit a trouble ticket in accordance with site Problem Management policy.

Table 3. Troubleshooting Resource Planning Problems

Symptom	Response
Unable to log in to the Planning Subsystem host (e.g., g0pls01).	Check with the Operations Controller/System Administrator to ensure that the host is "up."
GUI not displayed when the start-up script has been properly invoked.	1. Ensure that the DISPLAY variable was set properly. 2. Ensure that the xhost command was given on the initial login host. [For detailed instructions refer to the procedure for Launching Resource Planning Applications Using UNIX Commands (previous section of this lesson).]
Error message indicating that SNS (System Name Server) and/or Resource Model is/are in use using the selected Application ID.	1. Use another Application ID if working in a different mode from the person using the selected Application ID. 2. If working in the same mode as the other user, coordinate use of Planning applications with the other user and/or the System Administrator. [For detailed instructions refer to the procedure for Launching Resource Planning Applications Using UNIX Commands (previous section of this lesson).]
Error message associated with the Resource Editor.	Refer to Table 4, Resource Editor User Messages (adapted from the corresponding table in 609-CD-500-001, <i>Release 5A Operations Tools Manual for the ECS Project</i>).
Error message associated with the Resource Scheduler.	Refer to Table 5, Resource Scheduler User Messages (adapted from the corresponding table in 609-CD-500-001, <i>Release 5A Operations Tools Manual for the ECS Project</i>).

Table 3. Troubleshooting Resource Planning Problems

Symptom	Response
Other problems.	Check the log files (e.g., EcPIRpRe.ALOG, EcPIRpSi.ALOG, EcPIRpRm.ALOG) in the /usr/ecs/MODE/CUSTOM/logs directory for error messages. [For detailed instructions refer to the procedure for Checking Log Files (subsequent section of this lesson).]

Table 4. Resource Editor User Messages

Message Text	Impact	Cause and Corrective Action
A resource with this name already exists - re-enter name	Each resource name in the database must be unique.	1. Type a different name in the Resource Name field. 2. Click on the Save button.
Activity Type is Not initialized	Without this field initialized, the "Save" operation gets rejected.	1. Shut down all Resource Planning tasks. [For detailed instructions refer to the procedure for Shutting Down Resource Planning Applications (previous section of this lesson).] 2. Notify the Database Administrator to have the PDPS database initialized (run the EcPIDbBuild script in the /usr/ecs/MODE/CUSTOM/utilities directory). 3. Relaunch Resource Planning applications. [For detailed instructions refer to the procedure for Launching Resource Planning Applications Using UNIX Commands (previous section of this lesson).] 4. Resume the operation that elicited the error message.
Block Size must be an integer number – reenter	Integer only.	1. Type the appropriate integer (e.g., 1024) in the Block Size field. 2. Click on the Save button.
Block Size required	This is a required field.	1. Type the appropriate integer (e.g., 1024) in the Block Size field. 2. Click on the Save button.
Error modifying computer resource	Database interface error.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.

Table 4. Resource Editor User Messages

Message Text	Impact	Cause and Corrective Action
Error modifying computer resource comments	Database interface error.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
Error saving computer resource	The operation failed perhaps due to an error in the database interface.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
Error saving computer resource comments	Database interface error.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
Number of cpus must be an integer number	Non-numeric data are not valid.	1. Type the appropriate integer (e.g., 22) in the Number of CPUs field. 2. Click on the Save button.
Number of cpus required	This is a required field.	1. Type the appropriate integer (e.g., 22) in the Number of CPUs field. 2. Click on the Save button.
Operating system required	This is a required field.	1. Type the appropriate operating system data (e.g., IRIX 6.4) in the Operating System field. 2. Click on the Save button.
Partition Size must be a number - reenter	Integer only.	1. Type the appropriate integer (e.g., 400000) in the Partition Size field. 2. Click on the Save button.
Partition Size required	This is a required field.	1. Type the appropriate integer (e.g., 400000) in the Partition Size field. 2. Click on the Save button.

Table 4. Resource Editor User Messages

Message Text	Impact	Cause and Corrective Action
Resource is reserved - cannot modify	There is at least one resource reservation that specifies the selected resource.	<ol style="list-style-type: none"> 1. If the resource definition needs to be modified immediately, first delete all resource reservations that specify the resource. [For detailed instructions refer to the procedure for Deleting a Resource Reservation Request (previous section of this lesson).] 2. Modify the resource definition. [For detailed instructions refer to the procedure for Modifying a Resource (previous section of this lesson).]
Resource name required	Each resource in the database must have a unique name.	<ol style="list-style-type: none"> 1. Type an appropriate name in the Resource Name field. 2. Click on the Save button.
Resources loaded	The resources list has been loaded from the MSS baseline configuration.	For information only. No action is necessary.
Resources not loaded - file not found	The MSS baseline configuration file is not found in the previously designated directory.	<ol style="list-style-type: none"> 1. Notify the Configuration Management (CM) Administrator of the problem. 2. When the problem has been fixed, try again to synchronize resources from the baseline. [For detailed instructions refer to the procedure for Synchronizing Resource Listings (previous section of this lesson).]
Select a resource to modify from the list	The selected resource should be one of the defined resources.	Select (highlight) the resource to be modified in the Resource Name list displayed on the Resource Editor .
Strings should be selected	AutoSys definition requires the association of a string name.	<ol style="list-style-type: none"> 1. Move string resources between the Strings and Associated Strings lists as necessary by selecting (highlighting) the string to be moved, then clicking on the right or left arrow button (as applicable) to move the string to the other list. 2. Click on the Save button.
Total ram must be an integer number	Integer only.	<ol style="list-style-type: none"> 1. Type the appropriate integer (e.g., 1000) representing the computer's total RAM (in megabytes) in the Total RAM field. 2. Click on the Save button.
Total ram required	This is a required field.	<ol style="list-style-type: none"> 1. Type the appropriate integer (e.g., 1000) representing the computer's total RAM (in megabytes) in the Total RAM field. 2. Click on the Save button.

Table 4. Resource Editor User Messages

Message Text	Impact	Cause and Corrective Action
Unable to lock Resource tables - cannot delete resource	The resource or its member resource is being used by the Processing software.	Do not delete the resource definition at this time. The resource definition cannot be deleted while the resource is in use. 1. Wait until the resource has been released by Data Processing. 2. Try again to delete the resource definition. [For detailed instructions refer to the procedure for Deleting a Resource (previous section of this lesson).]
Unable to lock Resource tables - cannot modify resource	The resource or its member resource is being used by the Processing software.	Do not modify the resource definition at this time. The resource definition cannot be modified while the resource is in use. 1. Wait until the resource has been released by Data Processing. 2. Try again to modify the resource definition. [For detailed instructions refer to the procedure for Modifying a Resource (previous section of this lesson).]

Table 5. Resource Scheduler User Messages

Message Text	Impact	Cause and Corrective Action
A Reservation must be selected to delete	User cannot proceed.	1. If the desired resource reservation request is not included in the list displayed on the Resource Scheduler , click and hold on the Activity Type option button and select the appropriate category of activity (or select All) from the option menu that is displayed. 2. Highlight (click on) the resource reservation request to be deleted. 3. Select File → Delete from the Resource Scheduler pull-down menu.
A Reservation must be selected to modify	User cannot proceed.	1. If the desired resource reservation request is not included in the list displayed on the Resource Scheduler , click and hold on the Activity Type option button and select the appropriate category of activity (or select All) from the option menu that is displayed. 2. From the Resource Scheduler , highlight (click on) the resource reservation request you want to modify then click on the Modify... button to access the Resource Reservation Request Edit/Definition GUI .

Table 5. Resource Scheduler User Messages

Message Text	Impact	Cause and Corrective Action
Can't insert new ResvName: < > into database	The database cannot be updated.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
can't send requestActChg to resource model for resvName: < >	The database cannot be updated.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
Delete ResvName: < > from the list	The database cannot be updated.	Select from the list.
Error in creating a new object for row: < >.	The database cannot be updated.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
Fail to modify resvName: < >	The database cannot be updated.	1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
I can't find < Plan Name >.	There is a problem with the resource pool.	Enter a valid Plan Name.
Must select reservation	User cannot proceed.	1. If the desired resource reservation request is not included in the list displayed on the Resource Scheduler , click and hold on the Activity Type option button and select the appropriate category of activity (or select All) from the option menu that is displayed. 2. From the Resource Scheduler , highlight (click on) the desired resource reservation request.
New Resvation can't leave resources list of ResvName: < > empty	This required field must be filled.	Enter the name.

Table 5. Resource Scheduler User Messages

Message Text	Impact	Cause and Corrective Action
Open one Reservation at a time, Please	Reservation cannot be opened.	<ol style="list-style-type: none"> 1. Find and click on the open Resource Reservation Edit/Definition GUI. 2. Click on either the Save or Cancel button (as appropriate). 3. Open the desired resource reservation request. [For detailed instructions refer to either the procedure for Creating a Resource Reservation Request or Editing a Resource Reservation Request (previous sections of this lesson).]
PIRpSiScheduler::modifyReservation - can't save new info for resvName: < >.	The database cannot be updated.	<ol style="list-style-type: none"> 1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] <ol style="list-style-type: none"> 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
ResvName: < > already has status < >.	Action cannot be completed.	Choose a different action.
ResvName: < > can't replace new Interval List	The database cannot be updated.	Use a unique name.
ResvName: < > Selected Intervals list can't be empty	This required field must be filled.	Enter name.
ResvName: < > Selected Resources list can't be empty	This required field must be filled.	Enter name.
ResvName: < > accepts new resources list	Informational message.	For information only. No action is necessary.
resvName: < > can't replace new Resource List	The database cannot be updated.	<ol style="list-style-type: none"> 1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] <ol style="list-style-type: none"> 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.
ResvName: < > can't uncommitted < > RActAlls	The database cannot be updated.	<ol style="list-style-type: none"> 1. Check the database connections. [For detailed instructions refer to the procedure for Checking Database Connections (subsequent section of this lesson).] <ol style="list-style-type: none"> 2. If the problem recurs, call the help desk and submit a trouble ticket in accordance with site Problem Management policy.

Table 5. Resource Scheduler User Messages

Message Text	Impact	Cause and Corrective Action
resvName: < > fails to approve - status is changed to < >.	The plan cannot be approved due to conflicts with other reservations.	Resolve the conflict(s). [For detailed instructions refer to the procedure for Approving a Resource Reservation Request (previous section of this lesson).]
resvName: < > myTime: < > resourceName: < > conflicted Time: < > conflictResvName: < >	Informational message.	For information only. No action is necessary.
ResvName: < > resource list is less now	Informational message.	For information only. No action is necessary.
ResvName: < > status is changed from approved to committed	Informational message.	For information only. No action is necessary.
ResvName: < > status is changed to < >	Informational message.	For information only. No action is necessary.
Success to approve reservation Name: < >	Informational message.	For information only. No action is necessary.
Success to update resvName: < >name	Informational message.	For information only. No action is necessary.
This Name: < > with status: < > has been used, Please pick another Name.	The resource reservation request name must be unique.	1. Type a different name in the Request Name field. 2. Click on the Save button.

Checking Log Files

Log files can provide indications of the following types of problems:

- DCE problems.
- Database problems.
- Lack of disk space.

The procedure for checking log files starts with the assumption that the operator has logged in to the ECS system and the Planning Subsystem host.

Checking Log Files

- 1 Access a terminal window logged in to the appropriate host.
 - 2 Type **cd /usr/ecs/MODE/CUSTOM/logs** then press **Return/Enter**.
 - Change directory to the directory containing the resource planning log files (e.g., EcPIRpRe.ALOG, EcPIRpSi.ALOG, EcPIRpRm.ALOG).
 - 3 Type **pg filename** then press **Return/Enter**.
 - *filename* refers to the resource planning log file to be reviewed (e.g., EcPIRpRe.ALOG, EcPIRpSi.ALOG, or EcPIRpRm.ALOG).
 - The first page of the log file is displayed.
 - Although this procedure has been written for the **pg** command, any UNIX editor or visualizing command (e.g., **tail**, **more**, **vi**) can be used to review the log file.
 - 4 Review the log file to identify problems that have occurred.
 - 5 Respond to problems as follows:
 - DCE problems.
 - Notify the Operations Controller/System Administrator of suspected DCE problems.
 - Database problems.
 - Verify that relevant database servers are running.
 - Check for lack of (or corruption of) data in the database using either a database browser or isql commands.
 - Notify the Database Administrator of suspected database problems.
 - Lack of disk space.
 - Remove unnecessary files.
 - Notify the Operations Controller/System Administrator of recurring disk space problems.
-

Checking Database Connections

If applications (including the GUIs) are unable to connect to the database, data cannot be retrieved or (in the case of the GUIs) displayed. Consequently, if a GUI does not display data or if the display does not refresh, checking the database connections is a logical step in trying to isolate the problem.

The procedure for checking database connections starts with the assumption that the operator has logged in to the ECS system and the Planning/Management Workstation (e.g., e0pls03, g0pls01, l0pls02, or n0pls02).

Checking Database Connections

- 1 Access a terminal window logged in to the Planning/Management Workstation (e.g., e0pls03, g0pls01, l0pls02, or n0pls02).
- 2 Type **cd /usr/ecs/MODE/CUSTOM/cfg** then press **Return/Enter**.
- 3 Type **view filename** then press **Return/Enter**.
 - The *filename* is likely to be one of the following files:
 - EcPIRpRe.CFG
 - EcPIRpRm.CFG
 - EcPIRpSi.CFG
 - EcPIRpTl.CFG
 - Although this procedure has been written for the **view** command, any UNIX editor or visualizing command (e.g., **vi**, **pg**, **more**) can be used to review the log file.
- 4 Review the configuration file to identify the values for the following parameters:
 - **DBName.**
 - **DBServer.**
 - **DBMaxConnections.**
- 5 Type **:q!** then press **Return/Enter** to quit the view application.
- 6 Type **isql -UserID -Ppassword -SDBServer** then press **Return/Enter**.
 - For example:
- 7 Type **sp_who** at the 1> prompt then press **Return/Enter**.
- 8 Type **go** at the 2> prompt then press **Return/Enter**.

- A listing similar to the following one is displayed (some lines have been deleted):

spid	status dbname	loginame	cmd	hostname	blk
1	recv sleep	EcDpPrDeletion			0
	pdps_TS1		AWAITING COMMAND		
2	sleeping	NULL			0

	master		NETWORK HANDLER	
3	sleeping	NULL		0
	master		DEADLOCK TUNE	
4	sleeping	NULL		0
	master		MIRROR HANDLER	
5	sleeping	NULL		0
	master		HOUSEKEEPER	
6	sleeping	NULL		0
	master		CHECKPOINT SLEEP	
7	sleeping	NULL		0
	master		AUDIT PROCESS	
8	recv sleep	EcPlSubMgr		0
	pdps		AWAITING COMMAND	
9	recv sleep	EcPlSubMgr		0
	pdps		AWAITING COMMAND	
10	recv sleep	EcDpPrDeletion		0
	pdps		AWAITING COMMAND	
11	recv sleep	EcDpPrJobMgmt		0
	pdps		AWAITING COMMAND	
12	recv sleep	pdpsUsers	x0ais03	0
	master		AWAITING COMMAND	
13	recv sleep	EcDpPrJobMgmt		0
	pdps		AWAITING COMMAND	
14	recv sleep	EcDpPrDeletion		0
	pdps		AWAITING COMMAND	
15	recv sleep	pdpsUsers	x0pls02	0
	master		AWAITING COMMAND	
16	recv sleep	EcDpPrJobMgmt		0
	pdps_TS1		AWAITING COMMAND	
17	recv sleep	EcDpPrJobMgmt		0
	pdps_TS1		AWAITING COMMAND	
18	recv sleep	pdpsUsers	x0ais03	0
	tempdb		AWAITING COMMAND	
19	recv sleep	EcDpPrDeletion		0
	pdps_TS1		AWAITING COMMAND	
20	recv sleep	pdpsUsers	x0pls02	0
	tempdb		AWAITING COMMAND	
21	recv sleep	pdpsUsers	x0pls01	0
	pdps_TS1		AWAITING COMMAND	
22	recv sleep	EcPlRm		0
	pdps_TS1		AWAITING COMMAND	
23	recv sleep	EcPlWb		0
	pdps_TS1		AWAITING COMMAND	
24	recv sleep	EcPlSubMgr		0
	pdps_TS1		AWAITING COMMAND	
25	recv sleep	EcPlSubMgr		0
	pdps_TS1		AWAITING COMMAND	
26	recv sleep	EcPlSubMgr		0
	pdps_TS1		AWAITING COMMAND	
27	recv sleep	EcPlSubMgr		0
	pdps_TS1		AWAITING COMMAND	
28	running	pdps_role	x0pls01	0
	pdps		SELECT	

(28 rows affected)
(return status = 0)

9 Type **sp_configure "user connections"** at the 1> prompt then press **Return/Enter**.

10 Type **go** at the 2> prompt then press **Return/Enter**.

- A listing similar to the following one is displayed:

Parameter Name	Default	Memory Used	Config Value
Run Value			

number of user connections	25	7503	100
100			

(1 row affected)
(return status = 0)

11 Type **quit** at the 1> prompt then press **Return/Enter**.

12 Compare the number of actual connections (results of **sp_who**) with the number of connections for which the database has been configured (results of **sp_configure "user connections"**).

13 If the number of actual connections is very close to the number of connections for which the database has been configured, notify the Database Administrator of the fact.

14 If the number of actual connections is **not** very close to the number of connections for which the database has been configured, compare the number of actual connections with value for DBMaxConnections identified in the Data Distribution configuration file (Step 4).

15 If the number of actual connections is very close to the value for DBMaxConnections, notify the Database Administrator of the fact.

- It may be advisable to increase the value assigned to DBMaxConnections in the configuration file.
-

Practical Exercise

Introduction

This exercise is designed to give the students practice in resource planning activities.

Equipment and Materials

One ECS workstation or X terminal per student.

Statement of the requirements for the exercise.

Release 5A Operations Tools Manual for the ECS Project, 609-CD-500-001, one copy per student.

Mission Operation Procedures for the ECS Project, 611-CD-500-001, one copy per student.

Launching Resource Planning Applications

The exercise involves launching resource planning applications. The exercise begins with a student acting in the role of a resource user receiving the necessary information/requirements for launching resource reservation applications. The student launches the Resource Scheduler and Resource Editor consistent with the requirements.

Perform the following steps:

1. Launch the Message Handler, Resource Model, and System Name Server.
2. Launch the Resource Editor.
3. Launch the Resource Scheduler.

Shutting Down Resource Planning Applications

The exercise involves shutting down resource planning applications. The exercise begins with a student acting in the role of a resource user receiving the necessary information/requirements for shutting down resource reservation applications. The student shuts down the Resource Scheduler and the Resource Editor, and cleans up background processes consistent with the requirements.

Perform the following steps:

1. Shut down the Resource Planning tool.
2. Shut down the Resource Editor.
3. Shut down the Message Handler, Resource Model, and System Name Server.

Synchronizing Resource Listings

The exercise involves synchronizing resource listings. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for synchronizing resource listings. The student synchronizes resource listings as specified in the requirements.

Perform the following steps:

1. Access the Resource Editor.
2. Synchronize resource listings.

Determining Actual Processing Resources to be Added to the Resource Planning List

The exercise involves determining the actual processing resources to be added to the resource planning list. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for determining actual processing resources to be added to the resource planning list. The student determines the resources to be added to the resource planning list as specified in the requirements.

Perform the following steps:

1. Log in to the applicable Science Processor.
2. Change to the disk mount point (subdirectory).
3. Identify the disk name and size by changing to the disk mount point and typing `df -k .` (including the dot).
4. Identify the number of processors (CPUs) and amount of RAM (type `hinv`).
5. Launch Netscape.
6. Identify the Operating System by selecting the as-built file name corresponding to the desired host at the relevant DAAC (e.g., `x0spg01.asbuilt.html`).
7. Log in to the applicable Queuing Server host.
8. Identify the AutoSys instance (in the “autouser” directory).

Adding Resources to the Resource Planning List

The exercise involves adding resources to the resource planning list. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for adding resources to the resource planning list. The student adds resources to the resource planning list as specified in the requirements.

Perform the following steps:

1. Access the Resource Editor.
2. Access the appropriate detail GUI(s) for the type(s) of resource(s) to be added.
3. Define the type(s) of resource(s) to be added as specified in the requirements.
4. Save the added resource(s) in the resource planning list.

Modifying Resources on the Resource Planning List

The exercise involves modifying resources on the resource planning list. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for modifying resources on the resource planning list. The student modifies resources on the resource planning list as specified in the requirements.

Perform the following steps:

1. Access the Resource Editor.
2. Access the appropriate detail GUI(s) for the type(s) of resource(s) to be modified.
3. Modify the definition of the resource(s) as specified in the requirements.
4. Save the modifications to the resource planning list.

Deleting Resources from the Resource Planning List

The exercise involves deleting resources from the resource planning list. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for deleting resources from the resource planning list. The student deletes resources from the resource planning list as specified in the requirements.

Perform the following steps:

1. Access the Resource Editor.
2. Highlight the resource(s) to be deleted.
3. Delete the resource(s) as specified in the requirements.

Creating a Resource Reservation Request

The exercise involves the preparation of a resource reservation request. The exercise begins with a student acting in the role of a resource user receiving the necessary information/requirements for creating a resource reservation request. The student prepares a resource reservation request that is consistent with the requirements.

Perform the following steps:

1. Access the Resource Planning tool.
2. Prepare a resource reservation request that is consistent with the written or stated requirements.
3. Save the resource reservation request.

Editing/Modifying a Resource Reservation Request

The exercise requires the editing of a resource reservation request. The exercise begins with a student acting in the role of a resource user receiving the necessary information/requirements for editing an existing resource reservation request. The student modifies the resource reservation request consistent with the requirements.

Perform the following steps:

1. Access the Resource Scheduler.
2. Select the resource reservation request to be modified.
3. Make resource reservation request modifications consistent with the written or stated requirements.
4. Save the modified resource reservation request.

Validating or Rejecting a Resource Reservation Request

The exercise involves the validation or rejection of a resource reservation request. The exercise begins with a student acting in the role of “sponsor” receiving the necessary information/requirements for validating or rejecting a resource reservation request. The student validates or rejects a resource reservation request as specified in the requirements.

Perform the following steps:

1. Access the Resource Scheduler.
2. Access the specified resource reservation request.
3. Evaluate the entries in the resource reservation request fields.
4. Validate or reject the resource reservation request as specified in the requirements.
5. Save the modified resource reservation request.

Approving Resource Reservation Requests

The exercise involves approving resource reservation requests. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for approving a resource reservation request. The student approves a resource reservation request consistent with the requirements.

Perform the following steps:

1. Access the Resource Scheduler.
2. Access the specified resource reservation request.
3. Approve the resource reservation request as specified in the requirements.
4. Save the modified resource reservation request.

Committing Resource Reservation Requests

The exercise involves committing resource reservation requests. The exercise begins with a student acting in the role of Resource Manager receiving the necessary information/requirements for committing resource reservation requests. The student commits resource reservation requests consistent with the requirements.

Perform the following steps:

1. Access the Resource Scheduler.
2. Access the specified resource reservation request(s).
3. Commit the resource reservation request(s) as specified in the requirements.

Deleting a Resource Reservation Request

The exercise involves deleting a resource reservation request. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for deleting a resource reservation request. The student deletes the resource reservation request consistent with the requirements.

Perform the following steps:

1. Access the Resource Scheduler.
2. Access the specified resource reservation request.
3. Delete the resource reservation request as specified in the requirements.

Reviewing a Resource Timeline

The exercise involves reviewing a resource timeline. The exercise begins with a student acting in the role of Resource Planner receiving the necessary information/requirements for reviewing specified resource reservation requests on a resource timeline. The student reviews the specified resource timeline and responds to questions concerning timeline characteristics.

Perform the following steps:

1. Access the Resource Scheduler.
2. Access the Resource Reservation Planning Master Timeline GUI.

3. Adjust the resource timeline display as necessary to view the specified resource reservation requests.
4. Review the resource timeline.
5. Respond to questions concerning the resource timeline without error.

Troubleshooting Resource Planning Problems

The exercise involves troubleshooting Resource Planning problems. The exercise begins with a student acting in the role of Resource Planner receiving the necessary trouble symptom information and requirements for troubleshooting the problem(s). The student reviews the specified trouble symptoms, takes action to correct the problem(s), and responds to questions concerning the possible cause(s).

Perform the following steps:

1. Review the trouble symptoms.
2. Check Resource Planning log files as necessary.
3. Take action to correct the problem(s).
4. Respond to questions concerning the possible cause(s) without error.

Slide Presentation

Slide Presentation Description

The following slide presentation represents the slides used by the instructor during the conduct of this lesson.

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